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FOUNDED BY WILLIAM HUNTING, F.R.C.V.S.

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THE TUBERCULOSIS ORDER, 1914.

This new Order was published in *The London Gazette* of last week, and came into force on Wednesday. Notices given under the Order of 1913 are to have effect under this Order, and slaughters before the commencement of this Order shall be compensated under the old one, but in all other respects the Order of 1913 is now revoked. The Board of Agriculture have also issued an important circular letter to local authorities, explaining and summarising the provisions of the Order. The Order itself may be obtained from Messrs. Wyman and Sons, Fetter Lane, E.C., or through the agents in Edinburgh and Dublin. In many respects the Order simply repeats that of 1913, but some important modifications have been introduced. The chief alterations are:—The definition of notifiable disease has been extended to include "any bovine animal which is suffering from a chronic cough and showing definite clinical signs of tuberculosis." This is a good move, and will enable inspectors to deal with many dangerous animals which the 1913 Order did not touch. But it is by no means so certain that the Board have done well with regard to cases of "emaciation." The old definition of "tuberculosis with emaciation" was not satisfactory—it left the degree of emaciation necessary for condemnation to be determined by the individual judgment. The present Order alters the definition to "tuberculous emaciation," and the precise meaning of this is explained in the Board's circular. Here we are told that "not only must the animal be emaciated to a pathological degree as distinct from being in poor condition, but the emaciation must be due to tuberculosis."

The first of these conditions remains as difficult to determine as it was under the 1913 Order; and probably the second may prove more difficult still. Other conditions, capable of inducing considerable emaciation, may co-exist with tuberculosis; and, in the actual or possible presence of these, it is not easy to see what the inspector is to do. The result will be that, in some cases at least, a most dangerous animal will be allowed to live longer than need be. This clause seems to be the most unsatisfactory one in he Order. The Board may have some good reason for their ruling; but, on the face of it, it appears that the inspectors' diagnostic difficulties are increased, and the elimination of tuberculosis impeded.

The definition of notifiable udder disease is unaltered; and those of "advanced" post-mortem tuberculous lesions have altered very little. The amounts payable as compensation remain practically unchanged; but an important reform has been made in the principle of valuation. The complex double scale valuation of the old Order is swept away; and in its stead one valuation is to be made, which is to be "the sum the animal would be worth in the open market in its actual condition, and not the sum it would be worth if it were free from disease or suspicious symptoms." This is a great improvement.

The slight alteration in the clause dealing with the slaughter of diseased animals will enable slaughtering to be carried out with the minimum of delay. When the salvage received by the local authority exceeds the compensation paid to the owner, the surplus, after deducting expenses, shall also be paid over to the owner—a wise and just provision.

There are a number of minor changes in the Order—most of these clearly improvements. A veterinary practitioner need no longer report induration or other chronic disease of the udder, unless he is of opinion that the condition is tuberculous. Information as to notification need no longer be sent to the sanitary authority; and a copy of the veterinary inspector's report need only be sent to the sanitary authority if the animal is found tuberculous. The restrictions as to use of milk of a suspected cow cease to apply after three clear days from the veterinary inspector's examination, and come into force again when notice of intended slaughter is served. Apparently this automatic arrangement is to save the trouble of sending release notices; and the two other alterations just mentioned will also save much unnecessary labour.

The article regarding suspected animals in markets, fairs and sales, has undergone some alteration, the most important, is to permit the animal (at the option of the owner or attendant) to be moved from the market to a slaughter-house for slaughter.

With one exception, we think that the new Order will prove simpler and more effective than the old. But, in some districts at least, it would be advisable for veterinary inspectors to obtain copies of the Board's circular, which contains much general instruction regarding inspection. We emphasise this, because the circular distinctly states that some local authorities, when the 1913 Order was issued, did not properly instruct their veterinary inspectors; and we suppose that a few may not do so now. Lastly, we note with pleasure, that the State will now bear an increased share of the cost of compensation.

TOXIC RESULTS FROM THE MINIMUM MEDICINAL DOSE.

At one time I was of the opinion that the use of alkaloids of drugs in the form of tabloids and given hypodermically was a very convenient method of obtaining quick results and was without danger. Twice recently, however, I have had startling results.

Case I. A horse with acute laminitis refused to take a draught of oil, fought and became dangerous to himself and us in the box with him when balling was attempted. I therefore dissolved a one grain tabloid of Eserine sulph. in 10 c.c. of water. A 5 c.c. syringe was used, and injection was given intrajugularly. When half only had been given, and I turned to fill the syringe with the other half, his eyes rolled back, his neck arched, and he dropped to the ground as if shot through the brain. In a few seconds he was up again staggering. We supported him, and in about twenty minutes the danger was over. During this period he trembled violently, sweated profusely, breathing was greatly accelerated, gasping, sobbing breath, pulse about doubled. A little peristalsis could be heard, but no evacuations occurred. What would have happened had I dissolved the pellet in 5 c.c. of water and given it all at once? I reckon pure luck saved that horse's life.

Case II. A friend asked me to look at a cow which had received Calomel ʒi. and salts lb. ij., and the bowels were still in abeyance. Auscultation revealed very little peristaltic action, back raking brought out a few hard dung pellets. I thereupon dissolved a one grain tabloid each of Eserine sulph., Strychnine sulph., and Pilocarpine, and gave hypodermically. In about five minutes time she was in convulsions, and soon expired. My friend did not say much, but seemed to do a lot of thinking, and I expect next time will doctor his cows himself.

Is it unsafe, can anyone tell me who has had experience, to combine eserine with strychnine in the minimum medicinal dose? I might have expected excitement in a horse, but anticipated only good results in the case of a cow. It is the first time I have combined them, and it will be the last. And, again, I shall only use either of these drugs in urgent cases in future. Eserine I have used for years, and this is the first fright it has given me.

On page 420 of Winslow's Materia Medica he says: "Eserine has been used in strychnine poisoning, but is inferior to chloral, bromides, and anæsthetics, and while it is antagonistic to a certain extent, and alters the character of strychnine convulsions, yet animals die more quickly when poisoned by both strychnine and eserine than by strychnine alone." The latter half of the sentence seems to contradict the first. What did the cow die from, the eserine, the strychnine, or the combination? It appears to me that one grain of strychnine hypodermically cannot be given without a percentage of risk to the patient.

F. J. Dunning.

Govt. Vety. Surgeon, Lydenburg.
June 2nd.

THE OPERATION FOR SCIRRHOUS CORD

By W. R. Davis, M.R.C.V.S., Enfield.

Having had occasion recently to remove a very large scirrhous cord from a six year old cart gelding, I adopted a plan that I have previously acted on with good results, a note of which may perhaps interest some of your readers. I have found that when the tumour is entirely isolated from its adhesions before cutting the cord, the process of isolation is attended with an abundant hæmorrhage which is always troublesome and sometimes not easy to control, besides weakening the patient and prolonging the operation. To avoid this, I dissect away the adhesions of a part of the sides of the tumour so as to allow my fingers to get round the cord and get the chain of an ecraseur round it, then, after the cord is divided, I proceed to cut away the anterior and posterior portions of the adhesions with the ecraseur.

In the case referred to, after casting and chloroforming the patient, he was put on his back, with the legs well spread with a back rope. An incision the whole length of the tumour having been made, the skin was dissected for some distance all round the tumour, a curved seton needle and coarse tape was put through the tumour to help in drawing it out, and the dissection continued. The bleeding became abundant, and in spite of twisting vessels and hanging forceps, continued to trouble me and hinder the operation. I now confined the dissection to portions of the sides of the tumour about an inch and a half long, by favour of which I at length got the chain of the ecraseur well up on cord and soon had it divided. The tissue is much looser and less vascular in the upper parts of the tumour and could be broken down to some extent with the fingers, so that I was soon able to get the chain round the anterior attachment of the tumour and divide them, and then treat the posterior attachments in the same way, and remove the scirrhous mass.

Into the cavity, which was partly filled with blood and clots, was poured a pint of solution of perchloride of mercury 1 : 500, and deep tape sutures were used to unite the lips of the wound.

Next day the stitches were removed, the cavity emptied of clots and syringed out with perchloride solution; this was continued daily for a week. There was very little swelling and not much stiffness, and the patient never lost a meal and was out at grass in ten days.

Tenth International Veterinary Congress.

The Organising Committee are most anxious to have the help at the Congress of as many members as possible who can speak French or German, or both. Members knowing these languages, and intending to be present at the Congress, are requested to be good enough to send in their names to the Hon. Secretary, at 10 Red Lion Square, W.C.

ABSTRACTS FROM FOREIGN JOURNALS.

Treatment of Follicular Mange in the Dog.

By Prof. Gr. I. Slavu, Chef de travaux, Veterinary School, Bucurest.

The anti-parasitic properties of phenic acid are unquestionable. I have once more tried to make use of it, and to correct its irritant and coagulating properties by combining it with camphor, which is also an anti-parasitic. I prepared an ointment of—

Phenol	1 gramme.
Refined camphor	2 „
White vaseline	6 „

This I have applied in the following manner. The animal is shaved, even when the disease is localised to ensure that no undiscovered centres of disease escape treatment. A fourth part of the skin surface is well rubbed with the ointment on succeeding days. Four days later the dog is given a bath of 2 per cent. Sulphate of potass. Then the operations are repeated until the whole body has received three dressings if a light case, or four if a severe case. If there are pustules, it is absolutely necessary that all the pus should be extracted before the dressing is applied.

I have had cases cured in which I had dressed a third of the skin surface daily, but some susceptible animals showed toxic symptoms. In cases where it was not convenient to use baths, I have obtained as good results with the dressings only.

I have treated 24 dogs, of the ages of 8 months to 2 years—bulldogs, braques, ratters, fox terriers, pointers. In all cases the infection was diagnosed microscopically. Of these, in 16 the lesions were squamous—4 localised, 12 generalised. In 6 they were pustulo-squamous; and in 2 papular—one in the upper lip, the other generalised.

In one case, a bulldog, badly infected and in low condition, no parasites were found after the 22nd day, but the animal died 12 days later from pneumonia and hæmorrhagic enteritis following distemper.

The other dogs treated stood the treatment well, they gained weight, the skin regained suppleness, the hair commenced to grow, and after from 9 to 16 days the parasites disappeared. Cases which I have treated have remained free of the disease for four months.

That camphor plays an important part in this treatment is undoubted, for I have succeeded in curing sarcoptic and demodectic in the dog, though longer treatment was necessary than when phenol was added.

The dressing of camphorated phenol is superior to the phenol dressing, in that it does not entail any modification of the skin, thus allowing the medicament to penetrate the galleries.—*Arhiva Veterinara.*

W. H. B.

SCOTTISH METROPOLITAN VETERINARY MEDICAL SOCIETY.

(National V.M.A.—Scottish Branch.)

A meeting was held in the Royal (Dick) Veterinary College, Clyde Street, Edinburgh, on Saturday, June 20. The Chair was taken by Prof. Gofton.

The Secretary read the minutes of the annual meeting held on February 7, 1914, which were approved.

Apologies for absence were intimated from Messrs. Wallace, Anderson, Carmichael, Archibald Baird, and the President, Mr. John Riddoch, who was attending the burial of a near relation.

Enquiry before the Local Government Board. The Chairman said that in connection with the minutes he had to report that Mr. John Riddoch was appointed to represent the Society at the enquiry before the Local Government Board. This subject had been remitted from last meeting to the Council, and they had acted accordingly.

The International Congress.

The Secretary read a letter in connection with the 10th International Veterinary Congress to be held in London from August 3rd to 8th, and mentioned that he had a list of the subjects which would be discussed. Sir Stewart Stockman, Hon. Sec. of the Organising Committee, asked the Society to appoint one of their members as representative at that Congress.

The Chairman said the Council had discussed this letter and considered it desirable that a delegate should be appointed to represent the Society at the Congress. The appointment of a delegate committed the Society to a delegate's fee of 20/- or 21/-. The question of expenses was one which the Society could not in its present financial position consider, but they might find a member who was attending, at any rate, or willing to go on his own account to represent the Society. That suggestion was put forward by the Council for consideration.

Mr. Peddie moved that Mr. Inglis, Forfar, be asked to represent the Society.

Mr. Storie seconded, and the motion was agreed to.

Victoria Veterinary Benevolent Fund.

The Secretary read a letter from the Victoria Veterinary Benevolent Fund asking a donation to the funds. For some years they had given £1, and the Council recommended that the contribution be repeated this year. The object was sufficiently deserving to lead them to agree with the recommendation of the Council. (Agreed).

Scale of Fees.

The Chairman said a scale of fees had been sent to the Society by the National Veterinary Medical Association for charges for examinations in connection with insurance. The Council had agreed to submit this scale to the Society in the hope that they would give a unanimous expression of opinion in its favour or suggestions for modification. It was suggested that a copy of the scale of fees should be placed in the hands of each member, and that steps should be taken to obtain an expression of opinion from each individual member in favour or otherwise of the scale of fees. It was impossible to consider the subject at this meeting. He moved that the scale of fees be remitted to the Secretary to transmit a copy to each member of the Society, together with a covering note asking definitely for a reply approving or otherwise of the suggested scheme.

Dr. Bradley seconded the motion, which was agreed to.

Admission of Press to Meetings.

Mr. Storie moved that the Public Press should be invited to attend meetings of the Society when it was considered advisable by the Council This subject, he said, had been before the Council to-day. The motion was differently worded from what he intended to submit, but it was practically agreed to by the Council that the Press should be invited when deemed advisable.

Mr. Hannay seconded, and thought it would be better for the profession generally to let the public know what was going on.

Mr. Peddie asked what was the opinion of the Council on the motion.

The Chairman said the opinion was fairly well expressed by Mr. Storie in the words "when desirable," that the Public Press should be invited to attend meetings when considered advisable by the Council. The Council felt there were occasions when it was desirable and occasions when it was not desirable. The feeling was that it might be left to the Council to use their discretion in regard to inviting the Press.—The motion was then adopted.

Nomination.—Mr. John Taylor was nominated a member of the Society by Dr. Bradley, seconded by Mr. Peddie.

The Chairman said that Dr. A. Philp Mitchell, ch.m., m.d., f.r.c.s.e., had kindly consented to give a paper, which he was sure would be found interesting, on Tuberculous Milk in Edinburgh, and its relation to surgical tuberculosis in children. He felt quite sure in view of what had appeared in the Medical and Public Press within the last few months that Dr. Mitchell required no introduction to residents in Edinburgh or within a good many miles of the city. He had much pleasure in calling upon Dr. Mitchell to give his paper.

Dr. Mitchell's paper was profusely illustrated by lantern slides.

TUBERCULOUS MILK IN EDINBURGH: ITS RELATION TO SURGICAL TUBERCULOSIS IN CHILDREN.

By A. Philp Mitchell, ch.m., m.d., f.r.c.s., Ernest Hart Memorial Scholar, formerly McCunn Scholar in Surgery and British Medical Research Scholar.

The number of diseases known to be conveyed by milk is considerable, amongst the more important being Tuberculosis, Typhoid Fever, Scarlet Fever, and Diphtheria. The purity of the milk supply is, therefore, a matter of paramount importance. It is, however, beyond my province to consider the question in its entirety. The subject which I have selected is, I feel, not only interesting in itself, but of special significance in view of impending legislation.

Milk Supply of Edinburgh.

A short statement of the manner in which the milk supply of Edinburgh is supervised will make clear the urgent need for reform.

As in all large towns, Edinburgh derives its supply of milk from two sources—dairy byres within the city boundary, and milk imported from country byres. The latter is much the more important because, at the present time, almost two-thirds of the total amount of milk consumed daily in the city is derived from country byres and is conveyed to town by road or rail. Roughly speaking, the quantity of milk reaching Edinburgh daily from the country is about 10,000 gallons, as against 6,000 gallons supplied from the city byres.

City Byres. Inspection of the byres and cows in Edinburgh under the Public Health Department was first instituted in 1900.

In Table I. compiled from the Medical Officer's Annual Reports 1900-1913, the results of the administration are summarised.

It will be observed that much attention has been given to the establishment of better ventilated and more sanitary byres in Edinburgh. In 1901 there were 140 byres with 3,366 cows. Since then there has been a steady decrease both in the number of byres and in the cow population of the city. There are now about 70 byres with fully 2000 cows. This diminution can be accounted for in several ways—(1) the closing annually of several of the most insanitary byres, (2) the reduced price obtained at cattle markets for fat cows resulting from the import of frozen meat into this country, (3) the gradual transference of the town dairy trade to the country, where the dairy farmer can keep more cows at a smaller cost per cow than is possible for the city dairyman.

Table I. *Tuberculosis amongst Edinburgh Dairy Cows, 1900-1913.*

Year.	Byres in City.	Byres closed.	Number of Cows.	Veterinary Inspections of city byres	Veterinary Inspections of country byres.	Number of Cows removed for tuberculosis	Site of Tuberculous Lesions.
1900	124	—	3000	—	—	25	Tuberculosis of udder, 11.
1901	140	5	3366	1863	—	23	" " 14.
1902	127	15	3097	1601	—	16	Udder, 5; lungs, 4.
1903	115	4	3072	2021	—	35	Lungs, 24; udder, 5; clinical 5.
1904	115	3	2974	1866	—	39	Lungs, 27; udder, 5; clinical 7.
1905	111	7	2942	2113	—	37	Lungs, 23; udder, 9; clinical 5.
1906	108	4	2944	2211	—	31	Lungs, 20; udder, 5; clinical 5; uterus, 1.
1907	99	9	2765	2070	10	29	Lungs, 19; udder, 9; clinical 1.
1908	97	2	2793	1912	10	28	Lungs, 14; udder, 3; clinical 11.
1909	96	1	2831	1531	22	36	Lungs, 23; udder, 14.
1910	90	6	2708	1439	30	36	Lungs, 9; udder, 20; clinical 7.
1911	81	9	2446	1158	20	27	Lungs, 16; udder, 6; clinical 5.
1912	76	5	2318	1126	20	23	Lungs, 9; udder, 10; clinical 3.
1913	64	6	2195	946	40	25	Lungs, 14; udder, 11.

In spite of the closing of so many byres during the last 13 years the number of tuberculous cows removed annually from the city byres remains practically the same, which would point to very little benefit other than perhaps a supply of cleaner milk having followed from improved animal sanitation. These observations are identical with those made by Prof. Delépine in the Manchester district.

Of three veterinary inspectors attached to the Public Health Department only one is available for supervising the milk supply, the other two being engaged at Gorgie abattoir. That one veterinary inspector—who is also a food inspector—cannot possibly carry out an efficient supervision of the town and country byres is incontestable. While it may be claimed that the city byres are frequently inspected, as is shown by the fact that during 1911, 1158 visits were paid to these country byres, which number 250, are markedly neglected. During 1911 only 20 visits were paid to these byres. The inadequacy of such supervision is unquestionable. Further, the fact that each year the area from which the country supply is derived is widened justifies the call for a more active supervision being exercised by the Edinburgh authority.

The prevalence of tuberculosis amongst Edinburgh dairy cows is indicated in Table I. It is to be noted that the City veterinary inspector has ordered, on an average, the removal of 30 tuberculous cows annually from the city byres, and of the 30 about 10 had tuberculosis of the udder.

Country Byres. The country byres, which yield about two-thirds of the daily milk supply to the city, number 250, and are chiefly situated in the great milk-producing counties of Dumfries, Kirkcudbright, Wigtown, Lanark, Linlithgow, and Midlothian. Smaller quantities of milk are contributed by Aberdeen, Haddington, Berwick, Fife, Clackmannan and Kincardine.

I have already commented upon the existing inadequate supervision of our supply of milk from the country. Of country byres in Scotland there is very little veterinary inspection. The veterinary inspectors employed are generally also private practitioners. It is impossible for a private veterinary inspector to be so impartial as a veterinary inspector responsible to a public body.

The visits of the sanitary inspector are few—seldom more than twice or three times a year. The cowsheds generally are found to be much inferior, from a sanitary point of view, to those within the city, some being in a most unsatisfactory condition. They are for the most part dark, ill-ventilated, and either badly drained or, in some cases, not drained at all. These are the byres in which cows are kept for years, and should a dairy farmer unwittingly buy a cow with early tuberculous disease of the udder, it will remain for a long time in an apparently healthy state, giving plenty of rich milk, but yet teeming with tubercle bacilli. The advance of the disease is so insidious that few such dairymen ever detect its presence until the characters of the milk are changed or the cow emaciated.

Many of the cows also are neither so good, nor are they kept in the same cleanly condition as the city cows.

The greater opportunities for infection of human beings by milk from small byres in the country have not been sufficiently recognised by Public Health Authorities.

If, with the inadequate veterinary inspection at present existing in Edinburgh, we know that tuberculosis among dairy cows is a prevalent disease, how much more prevalent must it be in those small country byres that cannot with the present legislation be supervised at all for the protection of the public against an undoubted source of infection.

An important practical point to consider is the extent to which tuberculous cows yield tubercle bacilli in the milk. Until a few years ago it was a commonly accepted view that tubercle bacilli were only found in milk when the udder was affected. As a result of the experimental work of Schroeder in America, and more recently that of the last British Royal Commission on Tuberculosis, we now know this not to be the case. Their results prove indisputably that tubercle bacilli may, and do, gain access to milk from cows which clinically show no signs of udder tuberculosis, or, indeed any form of tuberculosis. At the same time it must be emphasised that extensive infection of milk with tubercle bacilli is chiefly from cows either marked "piners" or those affected with udder tuberculosis. On this account, chief importance must still be attached to cows with tuberculous infection of the udder.

The only accurate administrative method for estimating the prevalence of this condition amongst cows in country byres sending milk to Edinburgh is a system of thorough veterinary inspection, combined with the regular examination of samples of milk by inoculation. Such an investigation of milk samples is, as far as can be ascertained from official reports, very seldom carried out by the Edinburgh authority. The important relationship of this fact to the public health was one of the chief reasons for my undertaking a systematic examination of milk sold in Edinburgh, which was mainly derived from country byres.

Practically all milk imported from the country byres reaches the consumers through the milk shops, which number fully 400, whereas the great bulk of milk produced in the city byres is conveyed direct by van to the consumers, a comparatively small quantity reaching them through the milk shops. Hence milk, as sold in Edinburgh milk shops, is largely produced in country byres.

State of Country Milk supplied to Edinburgh.

Before discussing the results of my investigations, I think it desirable to state briefly the technique employed.

Samples of mixed milk were obtained from the milk shops in each municipal ward, representing 406 milk shops. The samples of milk were collected in the morning in sterilised pitchers and brought immediately to the Royal College of Physicians Laboratory. A pint of milk was bought from each milk shop. After allowing the milk to sediment during the day in a sterilised separation funnel in the ice chamber, the sediment was withdrawn and centrifugalised in the evening. The cream and supernatant milk were then poured off, and the deposit (mixed with a small quantity of milk and cream, generally about 5 c.c.) was inoculated into two guinea-pigs (subcutaneously and intraperitoneally). The animals were allowed to live at least three weeks.

The inoculation of the milk as soon as possible after receipt of the sample is of the greatest importance in reducing the number of premature deaths amongst inoculated guinea-pigs.

The inoculation method is recognised as the only reliable means of examining a mixed milk for the presence of tubercle bacilli. The microscopical test, on the other hand, is of comparatively little value for the examination of the sediment from a mixed milk, but in the case of milk from a single cow, it is possible by Delépine's special microscopic methods to detect tubercle bacilli in about 90 per cent. of the samples, which are proved to be infectious by inoculation.

Of the 406 samples of mixed milk collected from the same number of milk shops, I found that 82 samples (20 per cent.) contained tubercle bacilli. The lesions produced in the guinea-pigs were quite typical. With 36 of the 82 positive samples both experimental animals exhibited generalised tuberculosis. In the remaining 46 samples, one of the two animals inoculated with each milk sample developed generalised tuberculosis. The

following table shows the prevalence of tuberculous milk in each municipal ward.

TABLE II.

Samples of Mixed Milk collected from Edinburgh Milkshops, November, 1913—May, 1914.

Municipal Wards.	Number of Milk Shops in each Ward.	Number of Samples tested for tubercle bacilli by inoculation.	Samples found to be capable of producing tuberculosis by inoculation Actual No.	P.C
1. Gorgie	22	22	8	36·3
2. Dalry	33	33	8	24·2
3. Haymarket	19	19	4	21
4. Merchiston	36	36	8	22·8
5. Morningside	28	28	7	25·
6. George Square	33	33	4	12·1
7. St. Leonards	37	37	2	5·4
8. Newington	26	26	4	15·3
9. St. Giles	21	21	3	14·2
10. Canongate	21	21	4	19
11. St. Stephens	27	27	5	18·5
12. Calton	45	45	13	28·8
13. Portobello	17	17	3	17·6
14. St. Bernards	16	16	3	18·7
15. Broughton	24	24	5	20·8
16. St. Andrews	1	1	1	
	406	406	82	

Average per cent. for city = 20.

The milk shops which were found to have supplied samples of tuberculous milk derived their supply of milk from dairy farms situated in the counties of Midlothian, Linlithgow, Lanark, Dumfries, Kirkcudbright, and Wigtown,

It may be safely assumed that the results of these investigations indicate that a considerable number of the cows in country byres contributing to the Edinburgh milk supply are giving tuberculous milk. If the administrative arrangements in regard to Edinburgh milk had been adequate, the majority of these infected animals might have been eliminated from the herds supplying tuberculous milk.

Information as to the actual number of dairy cows in Scotland giving tuberculous milk is, unfortunately, still wanting, but since the coming into operation of the Tuberculosis Order on 1st may, 1913, more reliable statistics have been forthcoming. From the monthly returns issued by the Board of Agriculture and Fisheries I compiled the following table :—(III.)

Knowing the very imperfect existing veterinary inspection of country byres in Scotland, the above figures cannot be accepted as a true estimate of the prevalence of cows supplying tuberculous milk. Comparison of the prevalence in the various counties is quite impossible, because the number of cows examined in the premises from which cows supplying tuberculous milk were removed is not stated, and also because the Order has not been put into operation by all counties at the same date. Still, the above figures, such as they are, indicate that the number of cows supplying tubercu-

TABLE III. *Tuberculosis amongst Cows in Scotland—Number of Cows Slaughtered under Tuberculosis Order, 1913.*

Counties.	1913. May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	1914. Jan.	Feb.	Mar.	April.	May.	Total.
Aberdeen	...	...	...	...	...	12	24	26	17	10	18	22	18	147
Argyll	...	...	1	1	2	2	3	6	6	9	2	3	3	38
Ayr	...	...	10	11	25	24	18	10	18	9	17	4	15	161
Banff	...	...	...	...	...	...	...	...	...	...	4	1	4	9
Berwick	2	1	...	...	3	5	...	...	1	3	...	1	1	17
Bute	...	...	...	1	1	...	...	...	...	...	...	...	3	5
Caithness	...	...	1	...	2	...	...	3	2	...	2	...	...	10
Clackmannan	2	1	...	1	...	...	...	...	...	...	...	...	...	4
Dumbarton	...	...	1	...	1	...	...	1	...	1	...	...	...	4
Dumfries	...	...	7	3	...	5	4	...	3	2	5	4	3	36
Elgin or Moray	1	1	...	...	3	...	2	2	...	...	1	1	...	11
Fife	...	...	...	...	...	9	6	11	2	4	10	11	24	77
Forfar	18	5	10	4	6	6	9	4	5	5	6	5	13	96
Haddington	...	3	4	2	2	1	2	1	...	2	3	1	4	25
Inverness	...	...	...	...	2	...	...	...	...	...	3	...	1	6
Kinross	...	...	1	...	...	1	...	1	...	...	...	...	...	3
Kincardine	...	...	...	...	...	...	...	1	1	5	4	5	6	22
Kirkcudbright	9	7	4	5	8	11	12	9	4	7	11	7	12	106
Lanark	15	10	6	4	11	8	12	5	16	13	12	13	15	140
Linlithgow	...	...	...	...	...	...	...	2	...	1	...	1	2	6
Midlothian (ex. City of Edinburgh)	...	...	3	2	4	2	6	3	2	2	4	6	8	42
City of Edinburgh	...	...	...	...	...	2	1	1	4	3	1	1	...	13
Nairn	...	...	...	...	...	...	1	...	...	...	...	...	...	1
Orkney	...	...	2	...	2	1	...	...	...	...	3	2	1	11
Perth	...	...	...	1	16	16	10	4	2	13	11	8	9	90
Ross & Cromarty	1	7	2	...	1	1	...	2	2	1	3	...	5	25
Renfrew	1	1	...	1	...	2	5	10	8	2	7	5	9	51
Roxburgh	...	2	4	1	1	8	...	...	...	2	...	1	3	22
Selkirk	1	...	2	...	...	1	1	1	1	...	...	1	...	8
Stirling	...	1	3	2	2	4	...	4	2	1	...	...	...	19
Sutherland	...	...	1	...	...	...	...	...	...	...	...	...	...	1
Wigtown	...	...	...	...	2	11	8	2	6	4	4	2	4	43
													Grand Total	1249

lous milk in Scotland is by no means small and justifies the necessity for such an Order.

Of the 1,249 slaughtered cows in Scotland during the first year's operation of the Order, fully 370 were notified in the six counties (Dumfries, Kirkcudbright, Wigtown, Lanark, Linlithgow and Midlothian) which are large contributors to the daily milk supply of Edinburgh.

With such a milk supply as that of Edinburgh which yields tubercle bacilli in 20 per cent of the samples examined, the legislative measures required to render this supply pure are far reaching. The real solution of this problem depends largely on the infectiousness of the bovine virus for man.

The Relation of Bovine Tuberculosis to Public Health.

Before proceeding to discuss the subject as it concerns Edinburgh and district, let us consider briefly the development of our knowledge of human and bovine tuberculosis.

The identity of tuberculosis in man and the lower animals was experimentally demonstrated long before the discovery of the tubercle bacillus by Koch. As early as 1846 Klenke attempted to determine the transmissibility of bovine tuberculosis to man, and insisted upon the infectiousness of milk from tuberculous cattle. But it was not until 1865 that the communicability of the disease was definitely established by Villemin. He showed that the infection in cattle was essentially the the same as that in man. His conclusions aroused the greatest interest throughout the scientific world and stimulated many investigators to take up the work. One of the most important of these was Chauveau who, in 1868, pointed out the importance of the alimentary canal as a channel for tuberculous infection. Gerlach and Klebs in 1869-70 not only corroborated Chauveau's results, but were able to prove experimentally the dangers associated with the use of milk of tuberculous cows.

Although the discovery of the tubercle bacillus by Koch in 1882 seemed to decide the unity of the disease in man and the lower animals, it opened up new avenues of investigation. Rivolta and Maffucci in 1889-1892 were the first to attempt the differentiation of the varieties among tubercle bacilli. But the merit of determining certain cultural, morphological, and pathogenic differences of tubercle bacilli of human or bovine origin is due to Theobald Smith. The designation "human" and "bovine" which he applied to these types in 1898 has since been accepted by the British Royal Commission, the German Commission, and many individual workers of the highest authority. During this time numerous investigations on the infectiousness of milk from tuberculous cows and the proportion of tuberculosis in man which could be considered of intestinal origin were being carried out. Greater interest in the subject, however, was suddenly awakened by Koch's sensational announcement in 1901 at the British Congress on tuberculosis. The effect of his statement was to stimulate fresh investigations being undertaken to settle the matter. British and German Government Commissions were promptly appointed and many investigators throughout the world immediately set about to prove the communicability of the bovine virus from animal to man. The results of all their experiments showed that there are two chief types of tubercle bacilli—a bovine type and a human type—which can be differentiated by certain cultural and pathogenic properties, but the relative frequency of the two types of infection in the commoner varieties of tuberculosis affecting children was not decided, owing to the small number of cases investigated. The only way to obtain this information was by undertaking the examination of a large series of non-selected cases. The subject of tuberculous cervical glands in children—a very frequent disease in Edinburgh—had received very little attention, and this seemed to me a favourable one for investigation. Such an inquiry I recently carried out, a full report of which was published in the *The British Medical Journal* of January 17th, 1914. A brief reference to the results of these investigations will serve our present purpose.

Seventy-two consecutive cases of tuberculous cervical glands in children were investigated; of these 38 resided in Edinburgh and 34 came from neighbouring country districts (within a radius of 30 miles).

The material was removed at operations by Mr. Harold J. Stiles, at the Royal Hospital for Sick Children, Edinburgh. Guinea-pigs were inoculated with the tuberculous material as soon as possible after receiving it, and the lesions subsequently developing were the immediate source of the cultures.

Of the 72 cases, the bovine bacillus was present in 65 instances (90 per cent.) and the human bacillus in 7 (10 per cent).

The differences relied upon to distinguish a bovine bacillus from a human bacillus are based upon certain cultural characters and pathogenic properties. Thus, while the growth of the bovine type on artificial culture media is scanty and slow, that of the human type is ready and luxuriant. The bovine tubercle bacillus produces in rabbits, within five weeks, an acute generalised tuberculosis, ending in death, from the intravenous injection of 0.01 or 0.1 mgm. of culture. With the human tubercle bacillus intravenously injected in the same doses the lesions are limited, usually confined to the lungs and kidneys, progress slowly, are almost never generalised and death seldom results.

The two types cannot be distinguished from each other under the microscope, although the bovine type frequently shows short, thick, evenly and deeply staining forms, while the human bacillus is often longer, slender, curved, beaded and less deeply stained.

Without exception, the cases were those of children twelve years of age and under. The maximum incidence occurred during the second year of life. This is not surprising, when it is recalled that the large majority of children of this age are nourished in whole or in part on cows milk. I found that, in my series of cases, 84 per cent. of the children two years of age and under had been fed with unsterilised cows milk since birth. Whatever may be the case in other countries, the mode of feeding children in Britain, especially Scotland, is such as to favour bovine infection. That a large proportion of Scottish babies are bottle fed, and that it is the exception rather than the rule to sterilise the milk, are factors the significance and importance of which have not been fully recognised by many investigators in other countries.

A careful search was made in every case for the existence of pulmonary tuberculosis in the parents and other members of the household. When such a focus exists in any family it must constitute a probable and most dangerous source of infection. In only three instances was a history of pulmonary tuberculosis occurring in the patient's family found; in one case the mother and in the other two the father. Each patient had been living for years in contact with a "consumptive" when the glands appeared. In each of the three cases the human type of tubercle bacillus was isolated from the cervical glands. There was no history of pulmonary tuberculosis in the remaining four human cases. As regards the bovine cases, it seems more than a coincidence that in not a single case was there a history of pulmonary tuberculosis in other members of the family. In sixteen cases, however, one or more of the children in the respective families were affected with various forms of surgical tuberculosis.

How do tubercle bacilli reach the cervical glands?

The most common situation in which tuberculous cervical glands are found is in the upper part of the anterior triangle. This is explained by the fact that these glands receive their lymph from the faucial tonsils and from the naso-pharynx. The position of the tonsils at the entrance to the digestive tract favours infection more with food than with inspired air, a fact of great importance in considering the frequency with which cervical glands in children harbour the bovine type of tubercle bacillus. Furthermore, the very direct and short pathway between the tonsils and the tonsillar lymphatic glands explains the frequency with which well marked tuberculosis of these glands may be second ary to a small focus in a tonsil. Investigating the faucial tonsils from 64 consecutive cases of children suffering from tuberculous disease of the upper deep cervical glands, I found that 24 (37.5 per cent.) of these cases showed histological evidence of tuberculosis in the tonsils. From 19 of these cases I isolated the bovine type in 12, and the human bacillus in three.

I similarly examined the hypertrophied faucial tonsils removed from 90 children in whom the cervical glands showed no clinical evidence of tuberculosis: 6 (6·5 per cent.) of these tonsils gave histological evidence of tubercular disease, while 9 (10 per cent.) yielded positive results when inoculated into guinea-pigs. The bovine bacillus was present in three cases and the human in one case.

As evidence in favour of the view that the ingestion of tuberculous cow's milk is an important cause of surgical tuberculosis in children, I might record several cases in which the relationship of cause and effect appear to be obvious. The milk supply was investigated in every suitable case, and from many town and country expeditions I have gained much valuable information regarding the existing conditions under which milk is produced and sold. The opportunities for tracing bovine infection are much greater in small communities and rural districts than in large cities. As examples of what not infrequently happens let me instance the following:

(a) A country child, aged 9 months, whom Mr. Stiles operated on a few months ago for multiple osseous tuberculosis, proved to be a very interesting case. The father and mother and the other children were all healthy. The milk was obtained from a small dairy in the village. Invevstigating the milk supply of this patient, I discovered that of the six cows in the byre two had tuberculous udders, with the milk from both teeming with tubercle bacilli.

(b) There was brought a short time ago to the surgical out-patient department of the Royal Hospital for Sick Children, Edinburgh, a child aged one year and five months, suffering from multiple osseous tuberculosis. I elicited from the mother the following appalling history: the baby had been bottlefed with milk obtained from a small dairy farm. The mother had been informed by the child's grandfather, who worked on the farm, that soon after the birth of the child one of the cows had "gone wrong". He told how the animal had rapidly wasted, become so weak that it was unable to stand; it was actually milked lying on the ground. and this milk was used for human consumption! By this time it was thought expedient to call in a veterinary surgeon, who, finding the animal suffering from generalised tuberculosis with marked involvement of the udder, at once ordered its destruction and burial.

I merely instance these cases to show what is happening here and there throughout the country. They also prove that not only the resistance of the patient, but the dosage exercises a great influence on the extent and spread of the disease. While the faucial tonsils and the cervical glands must often succeed in killing the small numbers of tubercle bacilli which are frequently present in unsterilised milk, they fail to cope with such large amounts as are ingested by children, who are, unfortunately, being nourished with milk from a single cow with tuberculosis of the udder, or from a small herd harbouring a cow with udder tuberculosis, or with advanced clinical tuberculosis. It has been shown by Delepine that one part of the milk from a cow with udder tuberculosis is capable of infecting 100,000 parts of sound milk and producing tuberculosis in guinea-pigs. He, therefore, concluded that one cow with udder tuberculosis was capable of infecting the mixed milk from a large herd. Further, it may be confidently stated that the reason why so many children do not present any clinical evidence of tuberculosis, in spite of the fact that they are frequently drinking infected milk, is to be found in a consideration of the results of certain animal experiments.

Feeding experiments in animals have shown that while inhalation of tubercle bacilli is a certain method of infecting the animal, even when small doses of bacilli are employed, very much larger doses are required to produce the disease by way of the alimentary canal. It is perfectly plain, therefore, that when the milk is obtained from a single cow with udder tuberculosis, or with advanced generalised tuberculosis, or from the mixed milk from a small herd, containing one or more tuberculous cows, a child may receive the infection in concentrated form.

Fraser, working here under similar conditions on tuberculosis of bones and joints in 70 children under 12 years of age, isolated the bovine bacillus in 60 per cent. of the cases.

It thus becomes evident, from the results which I have briefly outlined, that the bovine type of tubercle bacillus plays a significant part in the causation of surgical tuberculosis amongst children residing in Edinburgh and district, and that the campaign against tuberculosis must include the bovine sources.

The Control of Bovine Tuberculosis.

In the light of our present knowledge, bovine tuberculosis can no longer be considered a negligible factor in respect to the spread of tuberculosis amongst children, more especially since unsterilised cow's milk in Scotland is a vehicle by which tubercle bacilli must very frequently be introduced into the bodies of children.

The control of bovine tuberculosis is undoubtedly a large undertaking, but I am convinced that important results would follow from local authorities being compelled to provide for a regular and adequate system of veterinary inspection by full-time officers, the frequent bacteriological and experimental testing of samples of milk and milk products by skilled bacteriologists, and the destruction of all cows which show evidence of udder tuberculosis, or which are clinically tuberculous. The extent to which these measures are dealt with in pending and existing legislation will be considered later.

While a number of towns such as Manchester, Liverpool, Birmingham, Sheffield, and Leeds have realised the necessity for taking steps to deal with this problem, very little has been attempted by local authorities in Scotland to prevent tubercle-infected milk from reaching the public—in fact sometimes the actual regulations enforced being considerably less than those set forth on paper. For example, the Edinburgh local authority has had the power under the Municipal and Police (Amendment) Act, since 1891 for the Medical Officer of Health or a Veterinary Inspector to enter any byre or cowshed wherever situated, if the milk produced therein is being sent for sale within the city, to examine any cow kept therein for the supply of milk and to take samples of milk. Such important powers as regards the country supply of milk to the city have, I regret to say, scarcely been exercised at all by the

said local authority. It is clear that for the proper exercise of these powers a sufficient staff of veterinary inspectors is necessary. I have previously referred to the existing inadequate veterinary inspection not only in Edinburgh but in Scotland generally.

It must be borne in mind that no purely local effort will suffice to eradicate bovine tuberculosis. Legislative measures on the widest possible basis are most essential and must include the whole country. Any measures to be effective must be so framed that they will be uniformly compulsory throughout the United Kingdom.

The great need for such a Milk and Dairies (Scotland) Bill as is now being considered by Parliament, requires no restatement here. I do not propose to discuss administrative details, but desire to refer only to some of its salient features.

Provision for veterinary inspection rightly comes in the very forefront of the Bill. But it is unfortunate that the appointment of veterinary inspectors for this purpose is not made compulsory. The importance of this will be seen later when we come to consider what power an urban veterinary inspector will have to enter any dairy in any district from which milk is consigned to his district. For the first time the necessity for prohibiting a veterinary inspector engaging in private practice in any district in which he holds office has been recognised. The city veterinary inspector retains his power to inspect any dairy wherever situated if the milk produced therein is being sent for sale within the city, but the extent and scope of the inspection is not indicated. From a later clause it is apparent that a sample of milk cannot be demanded or taken during an inspection. That can only be obtained by and through the Medical Officer of Health of the district in which the dairy is situated. This means that cities will lose the direct control over milk supplied to them from rural districts, a very serious matter unless the provision of efficient veterinary inspection is made universally compulsory.

But veterinary inspection cannot do everything. According to Delépine it is practically impossible for the veterinary surgeon unaided to discover by ordinary inspection early tuberculous lesions of the udder. Further, it is also impossible for the most experienced veterinary surgeon to distinguish by inspection and palpation tuberculous mastitis from all the other forms of mastitis. The question arises—How can it be detected? Inoculation of the milk into experimental animals is the most certain method. This is a test that should be made use of by the veterinary surgeon in all cases of udder disease, where a diagnosis cannot be arrived at from clinical examination alone. No mention is made in the Bill of the means to be adopted in detecting infected milk; there is no provision made for bacteriologists and laboratories as in the English Bill.

In the foregoing I have attempted to criticise some of the main provisions in the Bill, and point out their fundamental sources of weakness.

Before concluding, I wish to refer briefly to the Tuberculosis Order, 1913, which has now been sufficiently long in operation to admit of an opinion being formed as to its efficacy. The results of the first twelve months' operation have certainly justified its issue. But is the Order efficient for its purpose? I do not think that it sufficiently covers every case of tuberculosis in cows that should be dealt with if the disease is to be eradicated. For example, why should a cow with lung tuberculosis—a dangerous form of open tuberculosis—not come under the Order until it has become emaciated? During the time of waiting it is spreading the disease to other cows, which, sooner or later, will go through the same process.

And lastly, local authorities are called upon to take immediate steps for the provision of a sufficient and competent veterinary staff. It is to be hoped that this request will be more universally responded to than is the case at present in Scotland. In very few counties is a systematic veterinary inspection under the Order being carried out.

General Conclusions.

Cows' milk containing bovine tubercle bacilli plays a significant part in the causation of surgical tuberculosis amongst children residing in Edinburgh and district.

The high incidence of tubercle bacilli in milk imported to Edinburgh from country districts clearly points to the necessity of measures more stringent than those at present enforced being taken to prevent tubercle-infected milk reaching the public.

The danger from infected milk in Edinburgh cannot be regarded as other than serious. The fact that the supply of milk from country byres which yield almost two-thirds of the total amount of milk consumed daily in the city, and of which there is practically no veterinary inspection, is increasing annually, strongly emphasises the necessity for radical changes. It is a question which must be taken up and dealt with by the local authority. The only way to safeguard the public against this danger is without further delay, to grapple with the existing inadequate supervision of the milk supplied to Edinburgh from rural districts. The existing local powers should be exercised to their full extent and a sufficient staff of veterinary inspectors established. But veterinary inspection cannot do everything. A systematic bacteriological examination combined with experimental testing (by inoculation of animals) of milk samples carried out uninterruptedly year after year is indispensable — such samples to be collected not only from milkshops and milk vans, but at the railway stations. Bacteriological methods and veterinary inspection must go hand in hand, the former serving as a guide and also a check upon the latter.

It must be borne in mind, however, that no purely local effort will suffice to eradicate bovine tuberculosis. The provision of legislation for the whole country is very desirable in view of the inadequacy of the powers at present vested in Scottish local authorities to ensure a pure milk supply. Additional and more stringent regulations will have to be drawn up and applied so as to exclude the recognisably tuberculous cow from the milk supply, whether the seat of the disease is in the udder or elsewhere. Means must be provided for tracing diseased milk back to its source and stopping the source of such milk. These requirements can only be secured by the universal compulsory inspection of dairy cows by full-time veterinary inspectors, assisted by experienced bacteriologists provided with adequate laboratories. It is unfortunate that such demands are not fully met in the Milk and Dairies (Scotland) Bill now being considered by Parliament. Efforts should be made to have these incorporated in the Bill.

Until the proper legislative measures are obtained it is advisable for the public to boil all milk consumed in their families.

In conclusion I wish to express my warm thanks to Mr. John Riddoch for the benefit of his valuable experience and wide knowledge, and the great assistance he has given me all through my investigations in this subject.

Discussion.

Prof. Gofton said he was sure they would all agree with him that they had listened to a very interesting paper on this very important subject. The paper was now open for discussion.

Mr. Storie said this was a subject they could not go into very deeply at a moment's notice. He was almost pleased that the motion with regard to having the Press present at their meetings had not been carried

before this Lecture was given. If there was anything to be avoided in a question of this kind, it was panic. He thought that if the local papers had got hold of this paper, they would have made a great deal of capital out of it. They would have taken special note of the tuberculous cow lying on the ground and being milked. This would have alarmed the public to such an extent, that people would stop using milk for their children, and the result would be that even healthy cows would no longer be required. It would be to the loss of the veterinary surgeon if such a thing took place, although that was a secondary consideration. With regard to a model byre—he thought that the diagram showed about a foot space behind each cow. He thought there sh uld just be standing room for the cow, so that the dung and water might drop over the edge, and cows were kept much cleaner in this way. He agreed with the lecturer that milk testing was very unsatisfactory. He had tested milk from cows with tuberculous udders and failed to get tubercle bacilli. With regard to the milk being infected with tubercle bacilli where the udder is not affected—in his experience a great deal of milk became infected and dirty after it was drawn. It was a horrid practice in country byres to find milkers leaving pitchers behind the cows after the milk was drawn. He did not say that tubercle bacilli might not get into the milk in other ways, possibly through the blood stream, but possibly a great many samples might be infected after they were drawn from the cow. It was important to inoculate guinea-pigs, but every veterinary surgeon could not undertake that work; it was more suitable for one with a licence and accustomed to the work.

Mr. PEDDIE expressed gratitude for the most interesting paper. When Prof. Gofton said that the paper was open for discussion, he thought it was a pity that the discussion could not be held over till another day, when probably a fuller discussion might take place. He thought Dr. Mitchell's paper was the most interesting they had had submitted to the Society for many a day. It dealt with a subject, in which they as veterinarians were specially interested. and Dr. Mitchell had gone into the matter in a thorough and scientific way and had shewn some aspects of the subject with which they were not familiar. In the work he carried out he had conferred a very great service on the public. Speaking as a veterinary surgeon, he thought the problem of tuberculosis as it affected dairy cows, and the milk supply was not sufficiently taken up by the general public. He disagreed with Dr. Storie who said it would probably create a panic if the Press was admitted to the meetings and had pointed out the dangers that Dr. Mitchell had alluded to. He took the opposite view. The public was most apathetic, and if on any subject, it was on milk supply. It would do the public all the good in the world if they had this information laid before them, and were stirred up to do what they could to induce the legislature to bring about the effect so much desired by the lecturer. Twenty years ago he was interested actively with some gentlemen in Edinburgh in the object of establishing a dairy on hygienic principles. They had the idea that they would get cows which were tubercle free, and have the milk from these cows, and that all the employees in connection with the dairy would be under perfect medical supervision. In the light of further experience he was at that time over sanguine as to obtaining a sufficient number of tubercle-free cows and as to the expense of getting the cows. Their calculations were based on selling milk at 1/4 per gallon. In connection with the Sick Children's Hospital, they found that the milk supply of that Institution was of the very poorest possible character. They discovered that the milk supply was by contract. and that the cheapest contractor got the contract. Evidently the question of quality of milk supplied, where pure and wholesome milk was an absolute necessity, was disregarded, and the price was the main factor determining who was to get the contract. He was immensely interested in the figures and tables that Dr. Mitchell submitted, shewing that 10,000 gallons came to Edinburgh from the country and 6,000 from the town. One point in the table submitted was as as to the number of cows suffering from tuberculosis, and the amount of lesions. In 1910 twenty cows were found with lesions in Edinburgh dairies. That was an enormous number. He wondered if Dr. Mitchell could give the reason for that high number. He had pointed out the danger of infection in small byres. It was apparent that if there were a cow with tubercular lesions in a small herd, the risk of infection to children was greater than in the case of a large herd where the milk was mixed. He had mentioned something he did not agree with at first blush, that it was impossible to detect tuberculous lesions of the udder from other lesions by simple examination. Many would not agree with that view.

Mr. MCLAREN said he had to thank Dr. Mitchell for his very interesting paper. It was one of the most interesting he had heard for a long time, and dealt with a most important subject. The subject was a large one. The question had many aspects. Some they were perfectly familiar with, and others less so. Some aspects he knew little or nothing about. That was true of the aspect of the question with which Dr. Mitchell had dealt. He quite admitted that Dr. Mitchell's deductions were warrantable from his premises, but in regard to the incidence of tubercle in Edinburgh, it was a most important point if it could be determined whether the incidence of tubercle amongst children was larger in these areas from which the milk was drained. If it were found that the percentage of tuberculosis in Edinburgh was heavier than it was in the outside areas, it must be accounted for on other grounds than that of tubercle carried from the outside. If they determined that question, they could ascertain how far the milk supply was responsible, or if it was the only factor in the case. Veterinary surgeons of experience recognised that the clinical conditions about a tuberculous udder were distinguishable from all other forms of mastitis. One important symptom distinguishing it from others was the absence of history of any pain. It is a tragic thing about a tuberculous udder that there is nothing in the character of the milk for a considerable period to give an indication of danger, whereas in other forms of mastitis there is a marked change on the normal appearance and character of the milk. The condition and danger from tuberculous udders would not be so serious and dangerous if the milk was altered in character so as to arrest the attention of parties using it. He recognised the importance of what had been said on the urgent necessity for a more thorough inspection of dairy cows throughout the country. But there was one point on which he might say he differed. He could not see that the end in view could be efficiently attained by divorcing bacteriological examination from clinical examination. If a veterinary surgeon's inspection was to be of any service at all, it must embrace bacteriological work. Bacteriological examination should be part of any veterinary examination of cows' milk. There was great danger in looking through microscopes. A man who was able to see what was taking place in nature and was well equipped to do laboratory work was the man alone who should try to arrive at the solution of these problems. He had really appreciated on the whole what Dr. Mitchell had said on that important matter.

Mr. TAYLOR said he was very much gratified with the lecture, and as one of the County inspectors for Midlothian and a veterinary surgeon practising, he would give a practical case that came under his supervision. The cow in question had not been inoculated with

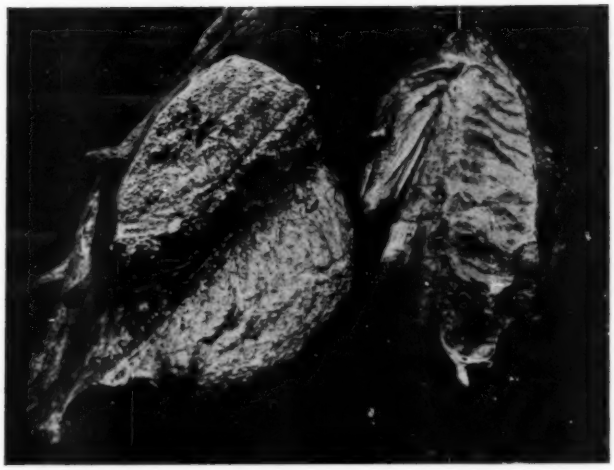


Fig. 1.

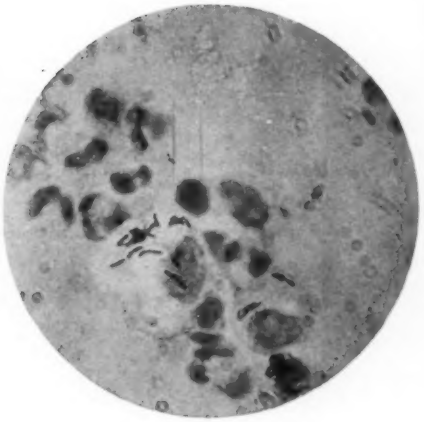


Fig. 2.

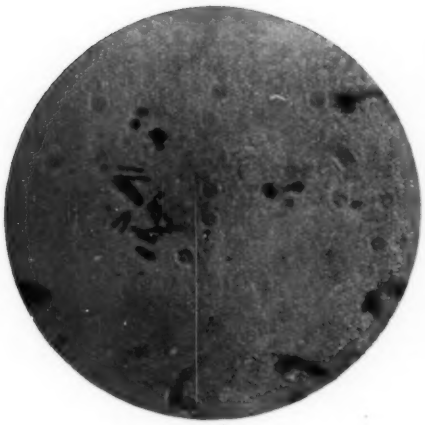


Fig. 3.

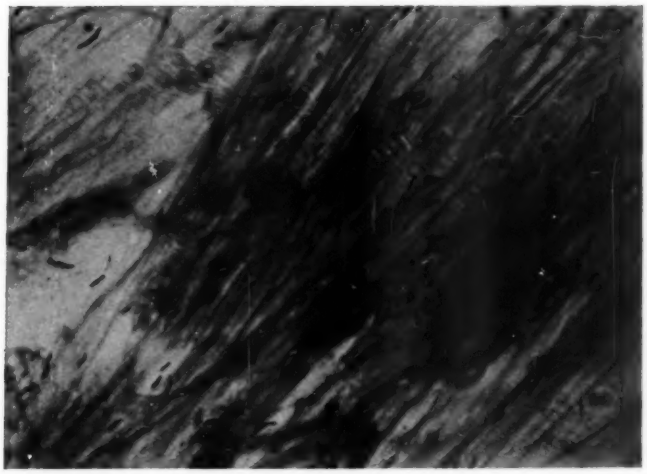


Fig. 4.

Fig. 5.

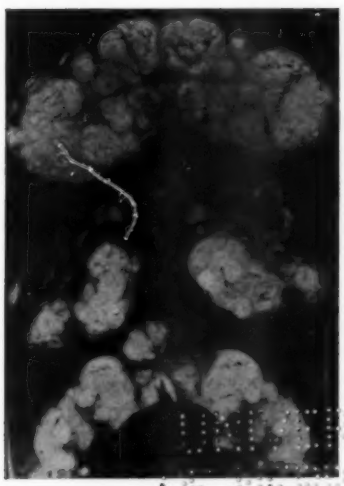
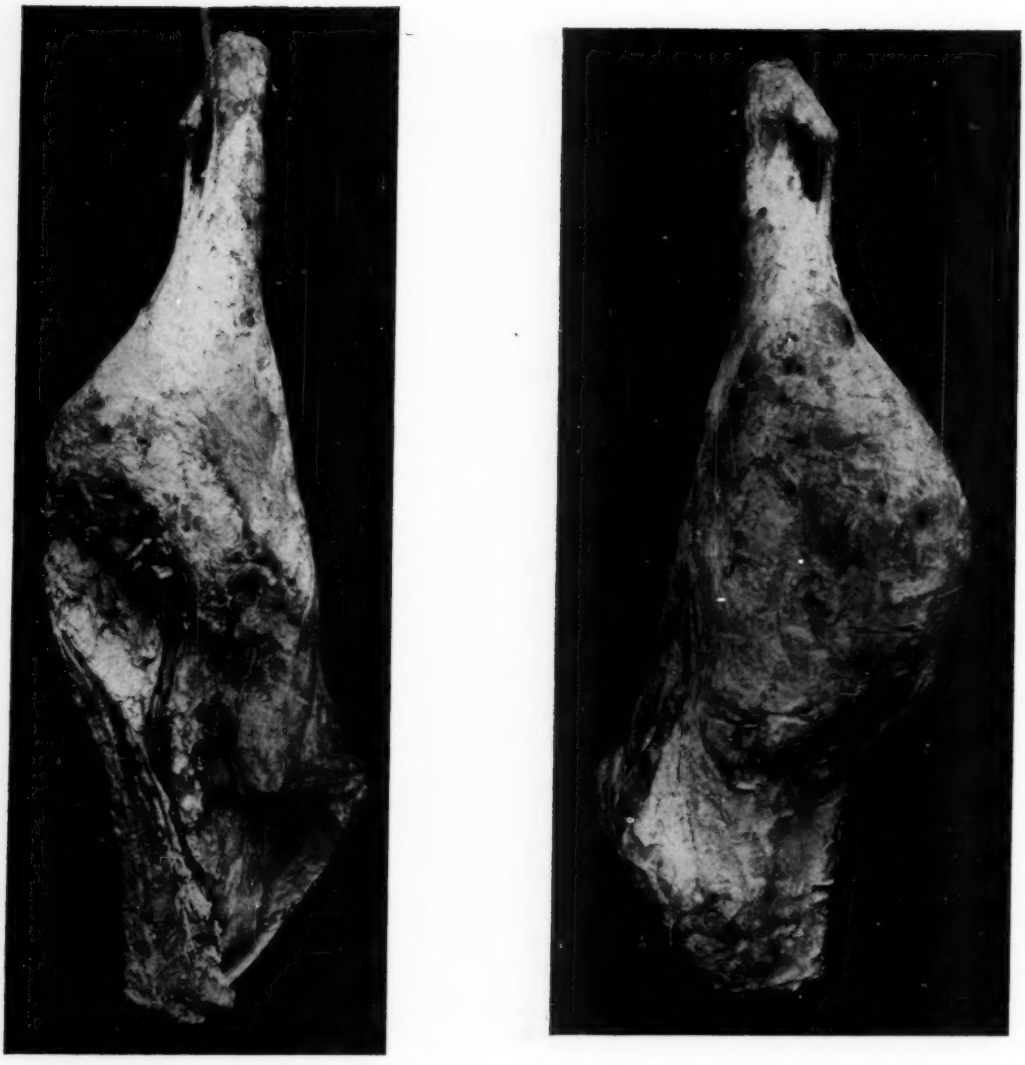


Fig. 6.

TUBERCULOSIS. To illustrate paper by Dr. A. P. MITCHELL.



BEEF IN COLD STORE.

Photo. by favour of Mr. T. Dunlop Young, M.R.C.V.S., Vety. Inspr. Smithfield Market, E.C.

ARTILLERY FIRE.

Fire injuries are grouped into those produced by artillery and those caused by infantry. The trifling losses occasioned by artillery fire in South Africa produced a feeling of contempt for all but its moral qualities. For instance, many thousands of shell were fired into Ladysmith, but the losses both among men and horses were small. On 6th January a battery stood in the open and was shelled from three sides, and had but three men and fourteen horses killed and wounded. We have seen at p. 67 that over 20,000 shell were fired into Mafeking during the siege, yet the total number of animals hit was thirty out of an original strength of roughly 700. The strength diminished considerably from February onwards, so that the percentage hit would be higher than that indicated, nevertheless it was insignificant. The explanation of the small loss from the Republican Artillery was due to the fact that they favoured common shell. Shrapnel, as used by our artillery, is most destructive, and we have noted at p. 67 the number of bullets lodged in the body of one horse exposed to this form of fire. At p. 46 also we have seen the recorded effect of a 40-pounder shrapnel fired into Ladysmith, which killed or wounded twenty-four mules and four men. It would be absurd to discount the destructive effects of artillery fire from South African experience alone. In a European War with larger masses engaged, and innumerable guns pumping in iron from quick-firing guns, the destruction, as shown by the recent war in the Balkans, is terrible.

Shrapnel fire kills or wounds with its bullets, common shell by the bursting of the projectile. In this latter case, if the shell fails to kill, by disembowelment or the removal of head or limb, quite a crop of jagged wounds may occur as the fragments scatter. These may be confined to the skin, or portions of the underlying muscles may be torn away. The horse fortunate enough to receive only grazes from flying fragments may be some little time under treatment, owing to the sloughing of the flaps, for the bruising is considerable. We have seen this was the case in Mafeking, where the wounds became indolent and sloughed; but there were two factors at work here, the pounding of the tissues and animals on siege rations, see also p. 67a.

RIFLE FIRE.

The bullet employed by the Republican Forces was chiefly the modern projectile common to all European Armies; but bullets of greater calibre were frequently used, especially the Martini. The long, narrow, present-day bullet is not devised for the purposes of humanity, but for its increased range and accuracy, and for the larger number of rounds which may be carried for a given weight. Incidentally, it is more humane, and unless a large bone be struck or vessels severed, no immediate, and frequently no subsequent, inconvenience results from the muscular wounds it produces. The bullet, by being made long and narrow, offers the least resistance to its passage through the air, and so long as it is in equilibrium it maintains its long axis parallel to its line of flight. At extreme ranges there is a tendency for its centre of gravity to become displaced, and the bullet may make half a revolution and strike base foremost; far more serious, from a surgical point of view, is the fact that the projectile may make one quarter of a revolution and strike side on. This will produce a wound of the most extensive nature.

There was little learned about the behaviour of narrow bullets during the war which had not been arrived at by experiments on the dead body during peace.* The destructive effects of the bullet depends upon it velocity and the resistance offered to its passage by the various structures of the body. The opposition offered by a purely muscular mass is relatively small, so that the projectile passes out, or ploughs its way for a considerable distance into the soft parts of the body. With bone the matter is different, those offering very little resistance, such as the blade of the scapula, are punched and the edges starred; with dense bones, such as those of the limbs, the resistance is considerable, the effects are consequently almost explosive in violence and the bullet partly breaks up. Pulverising effects may also be met with in the semi-rarified bones of the knee and hock joints, doubtless owing to the depth of tissue to be traversed.

In muscle pure and simple the path is narrow; there may be a channel little, if any, larger than the bullet, the path being identified by the trifling muscular hæmorrhage The length of the channel depends on the part struck; in the cavities of the chest and abdomen the bullet may find exit, with sufficient remaining velocity to enter one or more horses. In the muscular masses of the hind quarters the projectile may pass across and be found under the skin of the opposite side; when the animal is hit in purely muscular masses the bullet travels an extraordinary distance, and far out of reach. There may be two or three such wounds in the same animal which cause no inconvenience if vessels or bones have been avoided. The frequency with which these bullets twisted and turned in their course is noted at p. 17 d.

Wounds from ricochets are frequent, and may be extraordinarily severe; this, of course, is due to the amount of distortion the bullet receives before striking the body.

One of the greatest difficulties in practice is to determine *where* the horse is hit: the surface of the body has to be carefully searched to enable a minute cleanly punched hole to be discovered, the size is out of all proportion to the bullet, for the skin is elastic and stretches to allow the projectile to enter. We may be directed in our search for the point of entry by the existence of a little coagulated blood

* "The effect of the Lee-Metford Bullet on the Bones of the Horse." Veterinary-Captain F. Smith, *Journal of the Royal United Service Institution*, Vol. 38, 1894.

matting the hair; beyond this there is nothing to show, though the most extensive destruction may exist within. If the bullet gains exit the skin opening is larger and generally everted.

Injuries to the chest or abdomen are either fatal in a short time, or, if they have failed to find a vital spot, they cause no inconvenience. Such happy results are more common in the chest than in the abdomen, where a bullet can hardly fail to catch something in its course, generally the intestines, resulting in many and widely separated perforations, depending on the position of the convolutions at the moment of injury.

Injuries to the hoof present a remarkable character. When a bullet strikes the wall, the horn fibres open to admit it and at once close. They behave exactly as a piece of rubber does when fired into. Not a trace of blood may mark the spot of entry or exit, but merely a slight mark or graze of the horn, as if it had been in contact with a sharp pointed piece of rock, yet the structures within may be pulverised. This class of injury, fortunately rare, will always be a difficulty in practice; even a larger bullet, such as the Remington, may strike the hoof, enter, and leave practically no trace of its presence within.

The great lesson learned during the war in connection with bullet wounds was that of non-interference. There is ordinarily no reason whatever why a bullet should not remain in the body; with exceptions to be presently mentioned it causes no inconvenience. Probing is useless and dangerous, the clot of blood sealing the orifice is thereby removed, and whatever is introduced into the channel only aggravates what may be a perfectly simple wound. Injuries to the face involving damage to the molar teeth form an exception to non-interference, for the broken fragments of tooth should be removed and any loose portions of bone. Injuries below the knee and hock are frequently penetrating; if such is not the case the bullet may be felt, and should be removed, as it may prove a mechanical impediment to the working of the parts. If out of harms way it should be left alone. The extraction of bullets with the forceps supplied at the early part of the war, was a surgical operation far more destructive than the bullet; it converted a simple into a complex wound. A bullet near enough to the surface to be grasped may be removed with dressing or other forceps, though it is infinitely more tenacious of removal than this statement may imply.

When a long bone is hit and pulverized, there is no question of the extent of damage, for the part feels like a bag of marbles; but some joints, notably the knee and hock and the foot, may be pulverized within without any destructive feel being imparted on manipulation. Wounds of vessels are rapidly fatal when large trunks are involved, otherwise the surgery of the vessels is less important than in man.

There is always a difficulty in the Field in obtaining anything like exact information regarding fire injuries to animals; the man knows that his horse has been killed or seriously injured, and that it either fell at once or shortly after being hit. But where the injury occurred he is naturally ignorant, for the reason previously noted. When neither man nor horse return, the animal may or may not have been hit, but have passed into the hands of the enemy. It is only in siege operations that any opportunity exists for making an expert examination of each case of injury, yet a knowledge of the percentage of horses hit, and the proportion of fatal, serious and slight cases is of the greatest interest. In the Field, the more seriously injured animals are unable to move, and may consequently be returned as missing instead of wounded. Where large vessels are cut they bleed to death on the spot, and if the long bones of the limb are pulverized they remain where they are. Consequently, it is only those horses able to walk after being wounded, or still capable of carrying their riders, which subsequently find their way into a Field Hospital for treatment, and this no doubt has led many to regard the narrow bullet as producing insignificant results on the horse.

In the siege of Mafeking 79 bullet injuries were inflicted on horses, of these 52 died, 15 were destroyed, and only 12 recovered (see p. 67). All the injuries were produced by the Mauser rifle, and a weapon which can inflict 85% of fatal or incurable cases cannot be regarded as ineffective. Head's results * were much the same. The regiment he was with had 163 horses hit, and of these 77·3% were either killed outright or had to be destroyed.

The position of injuries on the body is information of the greatest interest, but, unfortunately, with one exception, no exact records are available. With man it is known that injuries of the upper half of the body are more frequent than those of the lower half, but we have very little of an exact nature to determine these questions for the horse. Theoretically his trunk must be hit more frequently than the limbs owing to the considerable area it offers. We are indebted to Captain (now Colonel) J. Moore for an exact classification of his wounded at the action of Ramathlabama (see p. 64 of this History). Of 300 horses present, 83 were hit, or 27%. Thirty-nine were killed outright or unable to leave the Field, and forty-four were subsequently treated for their wounds, of which the following gives the situation:—

Injuries to hind limbs and quarters				23
,,	,, fore	,,	...	6
,,	,, trunk		...	11
,,	,, head	...	...	4

Hits in the thigh and stifle were more frequent than elsewhere, and the excess of hind wounds over wounds of the fore part of the body may, in this case, be explained by the force having to retire. Only one animal was hit in the foot.

* *Op. Cit.*

The essential fact revealed by the War was the absolute necessity for adopting a conservative and expectant attitude in the treatment of rifle injuries.

VELDT SORES.

This class of sore was found among the horses in the Field, especially during General French's campaign on the Pongola (related at p. 158 b.). From the description given of it as an indolent ulcer affecting the limbs it would appear to resemble Bursattee. Others believed it to be caused by the irritating nature of the mud in which the animals were standing for weeks, but we have seen (at p. 166) that it occurred in the almost waterless northern territory. The matter is one on which we have little information, and apart from the above-mentioned outbreaks the disease did not generally appear among the horses in the Field.

INJURIES FROM LIGHTNING.

These were very common, or rather deaths from lightning stroke occurred probably every week during the wet season. A team of bullocks or mules, or three or four horses, might fall at a single stroke. The total loss of life from this cause throughout the campaign would be quite considerable, but records are wanting. It is remarkable how little there is to show on the surface of the bodies. Doubtless the hair and pigment of the skin conceal the tracings found in man, but there is frequently scarcely any singeing of the hair to indicate that the animal has been struck.

VELDT BURNS.

These were caused by the disastrous fires that occur, generally through carelessness, during the dry season. The fire spreads with extraordinary rapidity, and animals tied up on the picket line have very little chance of escape. In such cases the feet and limbs in severe cases are burned to such an extent as to demand the animal's destruction. If retained under treatment large areas of skin slough off, exposing the parts beneath, and indicating the hopeless results of further efforts.

Any camp in grass lands which, during the dry season, is to be occupied for longer than a night, should have an eight-feet clearing made all around it.

SEPTIC VILLITIS.

This class of injury was very common in the thorn country, see p. 166, where it caused a serious amount of inefficiency and subsequent loss from septic infection. No preventive measures suggest themselves. In the matter of treatment, the thorns (known in South Africa as "Wait-a-bit," and growing on a variety of acacia) are most difficult to remove; they break off flush with the skin and produce acute inflammatory trouble. In India, poultices of the earth thrown up by the white ant is employed to extract thorns, and in tropical and sub-tropical operations this remedy might be employed.

Injuries resulting in the serious class of affection know as Quittor have been sufficiently dealt with at p. 244; those due to Heel-gall have been described at p. 274; Sore-backs at p. 245.

POISONOUS PLANTS.

South Africa is not only the home of Epizootic diseases but also of a large number of poisonous plants, of which, even at the present day, very little is exactly known. Animals which have to gather their keep in the open are naturally much more exposed to infection than those stable fed, and throughout the War the loss occurring to all classes of animals from grazing was enormous. Not a column, practically not a unit, escaped from more or less loss. Thirty or forty cases of tulp or other vegetable poisoning in a few hours were by no means unknown. The consequent inefficiency was considerable, especially during the rainy season, at which time these plants spring into life and cannot be distinguished in their early growth from ordinary vegetation, especially is this the case with "tulp," which resembles shoots of young grass. Noxious vegetation is consumed by the new comer, but animals reared on poisonous pasture learn, apparently from experience, what to avoid, though this is by no means invariable.

The symptoms produced by poisonous plants may roughly be grouped into those which set up extreme gastro-intestinal irritation, for example, tulp, ink-bush, oleander, and those producing nervous symptoms, frequently indicated by tetanic convulsions, such as *Chailletia Cymosa*,* "Gift Blaar," "Klimop," *Cotyledon Ventricosa*,† "Slang Kop" and "Dronk Grass," the latter producing giddiness and symptoms resembling alcoholic poisoning. Nor does the above list by any means include all which are known. There are cumulative vegetable poisons which produce cirrhosis of the liver; others which cause laminitis in cattle, disorganization of the feet, bone and joint disease. Nor need we be surprised at these extraordinary local effects when we remember the action of Indian "mutters" in producing spasm of the larynx in the horse. It is not with the latter group we are concerned in this section. Only those poisonous plants which act rapidly and produce tympany and acute abdominal pain were recognised as poisonous, and "tulp" and ink-bush were the chief offenders, tulp predominating. There are some thirty-seven varieties of tulp, of which the one bearing the purple flower is the most poisonous. That it is consumed readily

* Local name not known.
† Idem.

by starving animals after months of drought is not to be wondered at. The effects are shown in a few hours—diarrhœa, acute tympany and pain, great collapse and rapid dissolution are the prominent features. Head* also noted the presence of a peculiar sour, musty smell of the mouth. There is nothing diagnostic in these symptoms, but the fact that a large number of animals are simultaneously affected tells its own tale. There are districts notorious for infection, but all low-lying ground in the neighbourhood of streams, rivers and water courses is liable to contain the plant. In spite of this well-known fact, it was remarkable how little attention was paid by many of those in authority in the selection of grazing areas. Animals were permitted to graze when waiting their turn to ford a river. It was natural to take advantage of this delay, often a matter of hours, yet no worse site could have been selected, though the high ground in the neighbourhood would have been practically free from danger. Over and over again disastrous results attended on the neglect of the simple precaution of selecting grazing areas; orders were published, but on service these are rarely read, or they are lost in transit, or put away and forgotten under pressure of urgent work.

The mortality from tulp poisoning is very high, though early and energetic treatment will save many. The most urgent matter is the relief of tympany, and this can be effected by puncturing the intestines. Of 172 cases punctured by Captain (now Lt.-Colonel) Dunlop Smith, 167 recovered. Of 72 animals not so treated, during his absence, only 14 recovered. So urgent are the symptoms that no delay must be permitted in the matter of puncturing the bowels. We have seen (at p. 96) that this had to be done by Lieut. (now Major) F. W. Hunt at a time when the force was closely engaged with the enemy. To clear out the intestinal canal as early as possible is imperative; in the hands of Captain Head, A.V.C. (R), the employment of Eserine met with good results.†

DISPOSAL OF THE DEAD.

The area of operations was strewn with the carcases of animals. An account of this at its worst stage is given at p. 41 d. The number of dead removed from the water of one section of a single river is mentioned at p. 118 d. It is impossible to give an adequate picture of the appearance of all camps and bivouacs, especially during the early stages of the war, when the troops were operating in large masses. The dead lay everywhere, and there was no means of coping with their disposal, for no labour existed for burial and no fuel for burning. As the various large centres became occupied it was evident that some effort must be made to collect the carcases dotted all over the neighbourhood, for they lay in the water sheds, and with the advent of the rainy season extensive pollution of water supply was certain.

At Kroonstad, for instance, where hundreds of carcases lay rotting, they were collected on an elevated piece of ground, laid side by side, and a deep trench dug around so as to cut off the water which, in the wet season, would have rushed through to the neighbouring stream. In this way no surface water could escape excepting by filtration. As an economical means of rapidly disposing of the dead this recommends itself, but is open to the objection that the putrefying mass is above the ground. The fine dry air of South Africa rapidly desiccated the remains, and later, in the case of Kroonstadt, Lieut.-Colonel Flintoff introduced the South American method of using dried animal material as fuel. The dried, mummified remains were easily ignited, and one carcase served as fuel to consume another. The whole in this way were completely burned. It is obvious, however, that no such method as this is applicable for some months, until the carcases are dry: in the meantime the air is poisoned.

Burial as a means of disposal naturally suggests itself, but digging a pit to hold a single horse is a big undertaking, one to hold fifty or a hundred bodies is an immense task, requiring a small army of labourers. Nor is there always a suitable site for such a burial ground in the vicinity of the carcases, so that these may have to be dragged by hand considerable distances. Where burial is resorted to, there should not be less than three feet of earth covering the bodies; the animals must be laid on their backs, as the most economical method of packing, and fitted in closely. The stifles and elbow joints must be cut across to allow the limbs to fall; and the abdomen must be opened.

On the scale with which destruction had to be carried out in South Africa, there was practically no method of rapidly dealing with the dead; 250 animals destroyed in a day from one hospital was by no means unknown. Long before these could have been buried, even had the labour existed, other batches would have been awaiting disposal. Destructions have one advantage over deaths, and that is, the most favourable site may be selected, and no dragging of carcases is necessary, but in all cases the mass should be isolated from the general surface of the soil by means of a trench to prevent the escape of surface water.

The Secretary of State for War was addressed in Parliament on the question of cremation being resorted to in South Africa for the disposal of animal carcases. The suggestion was a natural one from those unfamiliar with the fact that the country contains no fuel. An incinerator, however, was erected in connection with the veterinary hospital of Pretoria, early in 1902. Some months were occupied in discussing the matter and in getting out plans and estimates; finally, at a cost of £300, one was produced. Its working capacity was fifteen

* "The Wear and Tear of Horses during the South African War." *Journal of Comparative Pathology and Therapeutics*, 1903.

† Idem.

horses a day, at a cost, it was said, of about 1 cwt. of coal, exclusive of that necessary for the first heating of the kiln; including this, it was said to work out at 150 lb. of coal per head. In actual practice, however, extending over six months, it was found that not more than ten carcases a day could be consumed, and that the cost of fuel was much larger than the original experiments suggested; on one occasion as much as twenty tons of coal being used to consume fifteen carcases!

No more than two carcases could be placed in the incinerator at one time, and they occupied about two hours for complete combustion. The kiln was erected on the reverberatory system; the heat from the fire hole ascended between two skins of brickwork, and was then drawn through the central flue to the chimney, the draught being regulated by an iron damper in the main flue. The carcases were placed in the kiln by means of a crane. Experience in working showed that the inner skin of brickwork should have been made entirely of fire-bricks and much stouter, that the grating floor should have had larger holes so as to have allowed the charred bones to fall through; this would have prevented the clogging which occurred, necessitating the fire being allowed to go out in order to clear the interior.

The cost of erection and working, for the relatively small result obtained, appears to be prohibitive.

Where fuel is no difficulty and labour available, field cremation may be practiced by means of a cross trench dug in the ground, a detailed account of which method is given elsewhere.*

DEMOBILIZATION.

The termination of a campaign brings immediate relief to troops, but none to the technical branches of the army, and least of all to those charged with the duties of treating the sick and obliterating epidemic and epizootic diseases. The number of sick animals to be treated actually increases, as many which have been kept at work under pressure of military conditions are now available for repair, but, above all, the question of the obliteration of infectious and contagious diseases has to be taken seriously in hand. These facts are liable to be forgotten by the staff of the army, who, in a natural desire to reduce expenditure, press for reduction of establishment, and cannot understand why it is that a large veterinary staff is necessary after hostilities end. Hard as all previous professional work is, it now becomes still harder, for it is manifestly impossible to sell animals affected with contagious diseases, or those sick and lame. Some military and civil veterinary officers did not always realize why they could not be at once liberated from the country, for the rest which so many of them had both earned and needed. They did not, of course, know the extent to which contagious diseases existed, for in a campaign all is darkness beyond the immediate visual field of those not in administrative charge. The Administrative Officer who parts with his staff before the slate is cleaned deserves the difficulties in which he will surely find himself.

On the day peace was declared there were 28,700 sick horses and mules to attend to, and an unknown number of sick oxen, certainly not less than 10,000. Glanders, mange, epizootic lymphangitis, specific ophthalmia, cattle plague and pleuropneumonia existed. All of these had to be dealt with and obliterated; the Army Veterinary Service had never previously to undertake such a gigantic task. These diseases were spread over a sub-continent, and, though the troops had concentrated on the cessation of hostilities, the affected animals were strung out on four long lines from the coast, narrowing to three as Pretoria and Mafeking, the two extreme northerly points, were approached.

The first anxiety of the military authorities was the reduction of the number of animals now surplus to requirements. On the day peace was declared there existed 131,700 army horses, 76,600 mules, 12,800 donkeys, and 74,200 oxen. The cost of keep of these represented an enormous daily expenditure, so that the almost feverish anxiety shown to dispose of the surplus numbers can be readily understood. A country left desolate by over two years of constant war is not in a position to purchase any commodity, let alone live stock for which no keep existed. This was the condition of affairs in the Transvaal and Free State, and for the regeneration of these colonies a department was formed with some millions of money at its disposal—provided by the conqueror—for the purpose of setting up the late enemy on his feet, and starting him on the road to recuperation. This Repatriation Department has already been referred to in dealing with the question of glanders (see p. 282 c.). It required animals of all classes, and, as we have already mentioned, needed them early and urgently, if famine was to be avoided. The Repatriation purchased from the military authorities:—

Horses	...	23,700
Mules	...	51,800
Donkeys	...	5,700
Oxen	...	60,900

This still left an enormous number of horses for sale in Cape Colony and Natal, where money and food existed, and some 86,800 horses, 9600 mules, 3400 donkeys, and 2000 oxen, were in this way disposed of before the end of February, 1903, to private individuals as apart from the Repatriation Department.

The total sales of equines between 1st June, 1902, and the 28th February, 1903, amounted to: horses, 120,500; mules, 61,400; donkeys, 9000; and this represents the amount of susceptible material which was spread broadcast over the country. We have already seen (p. 282 d.) that a mere trifle among these animals was malleined, and we also know the result of our utter inability to carry this out. No physical

* See "A Manual of Veterinary Hygiene, 1905." F. Smith.

examination, no matter how conscientiously performed, can enable latent glanders to be detected without the mallein test. There were 9,500 horses and a similar number of mules destroyed between 1st June, 1902, and 28th February, 1903, and it is safe to say that at least one-third of this number was destroyed for glanders, so it is evident the disease was still rife. Nasal inspection was wholly insufficient to prevent affected animals being sold, and the consequent losses to private individuals, and especially the Repatriation Department, from glanders was extremely heavy.

Immense losses occurred from other causes, for instance: the majority of the horses purchased by the Repatriation Department were turned out on the late stock farms until required. No grazing existed, and no men were provided for the purpose of looking after the animals. How often has the lesson to be learned that horses cannot live without food?

Perhaps one explanation of the want of system in dealing with this stock was the difficulties which suddenly arose between the military and civil side. The "Times History" tells us* that "weeks of desperate haggling" over prices occurred. The animals, and the food for them, were priced too highly according to the Repatriation view; in fact, the military supplies, of which enormous quantities were available for sale, were finally discarded on account of the high price asked, as the Repatriation Department found they could import food and feeding stuffs cheaper than they could buy it on the spot from the military! It passes all comprehension why two public bodies, supplied from the same purse, should have been permitted to "haggle" over prices; but it is authoritatively stated that the dispute went on for weeks, the military holding the stock and the Repatriation requiring it. Importations of food and stock from over-sea followed; one can understand when such desperate action as this was taken by the Repatriation Department, that the controversy left little time for considering the case of the 21,000 horses turned out on farms to shift for and look after themselves.

The above events led to disasters of the first magnitude, for the unsold military supplies deteriorated, and were finally disposed of under circumstances so scandalous that a Royal Commission was appointed to inquire into the matter.

We have seen the difficulty throughout the war in getting sufficient food for animals. On the day when peace was declared there were 100,000 tons of oats, and nearly double that quantity of hay in the various supply depots of South Africa.† Nor does the above represent all the supplies subsequently available for sale, as vast amounts continued to pour in until March, 1903. On 31st May, 1902, there was sufficient food in hand to have allowed every horse in the country 12 lb. of hay a day for eight months, and 12 lb. of corn for four months. In the face of this it is extraordinary that horses should have been called upon to perform the most arduous and exhausting work on 10 lb. of oats, and no hay. This question, however, does not now arise. The food was available for sale for Repatriation animals, but, as we have seen, the two servants of the State failed to agree, owing to the "exhorbitant terms"* demanded by the seller, the result being that immense surplus stocks of food of all kinds, valued at £11,000,000, were left on their hands. Enforced sale now became necessary to save further deterioration, for all supplies were in the open, and we shall let the "Times History" tell the story† of "the most amazing blunders probably ever perpetrated":—

"A system was introduced of selling Government supplies to a contractor, who at the same time contracted to supply them back to the troops as they were wanted, at a difference in price which was supposed to allow a fair margin of profit after paying for sorting, removal, storing, issue and deterioration." The supplies, however, were not removed; they remained "where they were, and were served out by an A.S.C. subordinate as if nothing had ever happened, the only difference being that the contractor pocketed a heavy profit on the transaction."

To meet the army sales, mushroom contractors arose, and one of these secured within a fortnight contracts both to buy supplies and to supply them back to the army at a higher price. Oats sold at 11s. per 100 lb. were bought back at 17s. 11½d.! "As the firm had no capital it was benevolently arranged that it should be paid promptly for what it sold, and given credit for what it bought. It even received a refund of £21,000 on goods for which it had not yet paid. Over this deal in oats and other goods the firm netted £69,000 without effort and without risk, and others made still larger profits."‡ The loss to the State was estimated at between three-quarters to one and a quarter millions sterling.

The Repatriation Department met with other difficulties. They imported cattle, among other places, from Madagascar and German East Africa; with these they imported a new epizootic, the so-called East Coast Fever. There is reason to think that had the matter of re-stocking the country not been one of such urgency, greater attention would have been paid to the advice given to the civil Government as to quarantining these new importations at Lorenzo Marquez, the port of entry. They were not quarantined. In July, 1902, the newly-imported cattle were dying in large numbers at Komati Poort, and, under veterinary advice, it was recommended that the movements should cease, as they were suffering from "Rhodesian Red Water." Professional men, however, were far from unanimous as to the nature of this new disease; some declared

* Vol. vi, p. 48.

† "Times History." Vol. vi.

* Idem.

† Idem, p. 405.

‡ Idem, p. 615.

it to be Rinderpest, on the strength of the stomach and bowel lesions; some, "tsetse" disease; and amid these differences of opinion, which were perfectly natural on the introduction of a disease new to everyone, the civil side was urging the distribution of the cattle. They were allowed through, or at any rate came through, by rail and by road. They infected the Transvaal as far north as Pietersburg, to the west as far as Rustenburg, and the whole length of the road Komati Poort—Pretoria. In a few weeks the damage revealed itself, and from that long line the disease spread south, through Natal and the Free State. We are writing of events which occurred twelve years ago, but that period has not been long enough to obliterate East Coast Fever. It has brought ruin in its train, and cost countless thousands of pounds to South Africa.

The above does not complete the account of the curses attending war. The War Office, knowing the large surplus of animals in South Africa, saw no objection to bringing home horses from a country gravely infected with disease. They acted without veterinary advice. Every care was taken in the selection and inspection of the 800 required, and nothing was put on board to which a shadow of suspicion attached. The animals were selected from several centres, so that the risk of picking up something on the way to the port of embarkation had not suggested itself. On the arrival home of the ships hundreds of animals were found affected with mange. This was bad enough, but worse was to follow. The apparently unaffected horses were issued to batteries in various parts of the United Kingdom; among these animals epizootic lymphangitis appeared, and through sales of cast animals, this disease eventually spread to the horses of the civil population.

By this time surely the cup had been drained to the dregs! Everything that could possibly happen took place; every blunder that could be made was perpetrated. The Government knew for a year prior to the ending of the war that there was a feeling against bringing horses home from South Africa, mainly on the score of expense, and Lord Stanley, on 7th June, 1901, said there was no intention of bringing home the horses which had been sent out;* yet, a year later, this was done, and without consulting professional opinion as to the wisdom of such a policy.

The horses arrived home in August, 1902; it was not until December, 1903, that M'Fadyean recorded a case of Epizootic Lymphangitis in a horse attending the clinique of the London School. The animal was a cast horse from the service, and bore the brand of having been in South Africa. At this time the disease already existed in several military centres; five months later, May, 1904, other cases of the disease were met with in civil life, though confined to cast horses, and the Board of Agriculture published an "Epizootic Lymphangitis Order" preventing the movement, and securing the isolation of animals so affected. By July, 1904, the question assumed so alarming an aspect that information was asked for in the House of Commons. The Secretary of State for War stated that the total number of army horses affected to date was 394, and that the disease existed at 30 different military stations, the worst being Woolwich, where 231 cases had occurred; 254 in all had been destroyed, 32 recovered, and 108 remained under treatment. All sales of cast horses from affected units were prohibited for six months after the last case of the disease. A year later, April, 1905, it was elicited in the House that of the above 108 cases remaining in 1904 sixty had been destroyed, and that 96 fresh cases had occurred during the year in English garrisons, one in Scotland, and five in Ireland. On 12th May, 1905, the Secretary of State informed the House that the disease in the army had practically been stamped out.

The above summary of a serious and costly outbreak of disease, and the introduction of a new terror to horse owners in this country, was entirely due to the neglect to take veterinary advice. No one with any notion of the extent to which the horses in South Africa were exposed to infection, in an army literally riddled by epizootic diseases, would ever have thought of carrying this combustible material to a clean country. Who was to blame for this waste of public money? The question was not publicly asked, but there is little reason to doubt that the suggestion to bring these horses home arose with the Remount Department of the War Office, or at any rate, received their approval. It was the culminating blot on an Administration which from first to last blundered through ignorance, not only in its own special work, for which no ignorance is excusable, but in all veterinary matters with which it interfered. The evidence on these points has been fully set forth in the previous pages of this history.

The remaining act of demobilization was concerned with the personnel. India had for two and a half years been kept short of its proper proportion of veterinary officers in order to supplement the numerical weakness in South Africa. Seventeen officers were returned to India before the end of 1902. Fifty Civil Veterinary Surgeons were also sent home or took their discharge in the country on reduction of Establishment. The whole of the Indian Hospitals, together with their personnel, were returned to India.

By December, 1902, the fifty Field Veterinary Hospitals had been disbanded; twelve Station Veterinary Hospitals were formed for the Army of Occupation, and four Mobile Hospitals organized. The stores in the various advanced Depots were distributed among the Station Hospitals, so that each should possess an independent reserve in the event of difficulties arising. The base depot at Cape Town was retained, and into it all material surplus to the above requirements was returned.

* See *Times Report*, 6th and 7th June, 1901.

VETERINARY STORES AND EQUIPMENT.

A consideration of this subject mainly resolves itself into questions of supply and distribution. The early history of both these have been incidentally dealt with at p. 4, where it has been shown that the army, presumably ready to take the Field, was without veterinary equipment of any kind, excepting a few old chests of the Peninsular and Crimean days. It is almost beyond belief that such a state of affairs existed, but it had its parallel in the astonishing shortage of all other military stores and equipment, to which sufficient reference has already been made at p. 3. As a matter of fact, the Force did not take the Field without equipment: owing to the steps taken by Colonel Duck, the then Director-General (see p. 9), sufficient material had been constructed to furnish each unit with an outfit, but it was the bare minimum, and not calculated to last more than three months. A reserve of this equipment for meeting wear and tear did not exist; the measures for replenishment were of a meagre and hand-to-mouth order, and only included a few of the more common drugs, and no instruments. For hospital equipment nothing existed but a few pairs of obsolete panniers; this cannot be wondered at, as hospitals formed no part of the War Office scheme.* The supply of stores to an army in the field is carried out by a depot under an officer with a staff of subordinates. The officer is responsible for the receipt and issue of stores, the record of which is made in ledgers and supported by receipts. It was known that a Veterinary Store Depot would be required, with a properly trained technical staff of ledger keepers, store-holders, issuers, packers, men for the purpose of off-loading and loading the various means of transport conveyance, and a building for the reception of stores and the transaction of business. Nothing existed. No officers had been trained in the technicalities of store management, no storehouse existed, and not a single subordinate of any kind. The measures taken by Colonel Rayment at Cape Town, and Major Crawford at Pietermaritzburg, to remedy this state of affairs have been recorded at pp. 10-13. The Authorities were not ignorant of these requirements. We have seen. at p. 113c, that the only scheme approved by the military department for the supply of stores in the Field was a base depot under an officer, and an advance depot under a Farrier-Serjeant! To this man, under no skilled supervision, was to be entrusted the responsibity of issuing poisons and suitable dressings to the army. The whole thing was incomprehensible; nothing, of course, came of it, for neither the man nor the depot existed excepting on paper. The scheme was too wild to admit of consideration, nevertheless, it is necessary to draw attention to the matter as one explanation of the shortcomings of a branch of supply which had to be created in the Field out of nothing, and, throughout, worked under the greatest stress and difficulties.

The entire absence of any reserve of drugs, dressings or instruments was due to the parsimonious policy of the Cabinet. The impression existed that when material was required it could be bought from the trade. That the prices would then be famine prices was not considered as a deterrent, and the fact that even wholesale houses have a limit in their capacity for delivery was not taken into account. Worse than all, it never seems to have entered the minds of the economists, that the stock of instruments held by the largest houses is only sufficient to meet the ordinary trade, and that if this material were required in large amounts it would actually have to be manufactured. This turned out to be the point on which the whole of the delay in supply worked. Taking the Field without a reserve meant serious delay in supply, for the whole of the material had to be produced, and it was never possible to overtake this initial delay. This was the explanation of the natural grumbling which existed when veterinary officers were unable to obtain for their large hospitals the full amount of dressings and instruments asked for. Those which existed in store had to be doled out equally all round, and the supply never could keep pace with the demand. Another result of this panic form of supply was that material defective in manufacture was received; thermometers incorrectly graduated, hypodermic syringes marked in cubic centimetres instead of minims, and even then of wrong capacity and unequal bore, steel goods of brittle manufacture due to haste in tempering, these and a series of other defects led to increased strain in the matter of supply. It took four months from the time a cable was despatched before stores were received in South Africa. This speaks for itself, and try as one would to anticipate requirements it was impossible to obtain the mastery. Every month saw thousands of horses pouring into the country, all of which, as we have seen, only added to the large number already sick and inefficient, for which drugs, dressings and instruments were required in ever-increasing quantity.

The cost of veterinary stores during the war ran into some hundreds of thousands of pounds, yet not a single officer was exclusively available for the care and distribution of this public property. It was added to the duty of a man whose hands were already full, and who could only devote a fraction of his time to what should have been an entire charge. This officer had to train himself in the intricacies of military supply and accounting; no previous training in this essential duty had been given the officers of the A.V.D., apparently it had never been thought of. The comfortable peace system of getting all that was required direct from wholesale druggists and instrument makers did not lend itself to the training of officers in a duty of the utmost moment on taking the Field, and, in consequence, no scheme had been thought out and no instructions issued.

* See this History, pp. 3a, 5d, 10a, 69a, 113b, 114a.

tuberculin, but its milk had been examined under the microscope by Mr. Riddoch and Mr. Mathieson with no result. They had tuberculosis in the sputum, but the cow had calved and how was he to get it? There was interesting work in the county in regard to the Order. Dairymen were not satisfied with the compensation and the way in which the Order was carried out, but he thought a good time was coming for them. He endorsed Dr. Mitchell's statement that they wanted an all-time inspector for the county. The inspection was inadequate. He knew of a case where there were a couple of horses in the byre along with cows, and there was quite a lot of things to put in order. From the figures put upon the Board he observed that the Calton Ward, one of the poorest districts in Edinburgh, had the biggest number of tuberculous samples taken from it. It seemed to be in the poor districts where most trouble occurred among the children. The higher classes did not suffer so much. In these circumstances, the sooner they had full time inspection, the better.

Mr. CAMERON said this was a subject in which he had taken a great interest for many years. He was one of those who had inspection of dairies when it was instituted by the Veterinary Department of the Privy Council before it was put into the hands, unfortunately, of the Local Government Board. He had watched the system closely ever since. There was no aspect of the subject that could be painted too bad. Not only the profession but the public were indebted to Dr. Mitchell for what he had done in the way of investigation. He thought that a full discussion of this important subject ought to be postponed, more especially as so few members of the Association were present to-day. He remembered on one occasion about two years ago when a lecturer had remarked that tuberculosis was the goose which laid them the golden eggs, and if tuberculosis were abolished, about one-half of the income of veterinary surgeons would be gone. Human nature with its selfishness did not need any further hints that they must not kill the disease too quickly. He was very glad that Dr. Mitchell had not made any remarks of that sort. He was pained to hear any one making light of tuberculosis, and that any member of the veterinary profession should do so was very reprehensible. He thought they should have frequent public demonstrations showing the character of the animals which were supplying milk ; they would then have the public at their back and make rapid progress. If they had not an interested active public supporting them, they could get nothing done. Instead of deprecating the public knowing anything about the matter, they could not bring too much publicity to bear upon it. Criticising the Milk and Dairies Bills, he said, that although the Bills were better than some of those that had gone before, he thought they were still so defective that they were not worth the paper they were written on.

Prof. WILSON proposed that in view of the great importance of this subject, the discussion should be adjourned. Many of them had something to add ; they all had a great deal to learn from it. If Dr. Mitchell would be kind enough to attend on a future occasion, he would increase their indebtedness for his excellent paper, the best he had ever heard on the subject.

Prof. GOFTON said he thought the discussion might be adjourned with considerable advantage, but they were entirely in Dr. Mitchell's hands. They should be very much gratified and much indebted to Dr. Mitchell if he saw his way to come back and listen to further discussion and reply to the discussion so far as it had already gone.

Dr. MITCHELL said he would be pleased to come back on another occasion. He thanked the Chairman and the various speakers for the kindness and generosity with which they had treated his communication.

Mr. PEDDIE hoped that Dr. Mitchell would be good enough to allow his paper to be published in the veterinary periodicals.

Prof. GOFTON said he felt he was expressing their feelings when he said they were deeply indebted to Dr. Mitchell for his presence and his promise to come to another meeting of the Society. The paper would be published in the veterinary periodicals so there would be an opportunity of carefully reading it before their discussion at next meeting.

The discussion was then adjourned till the October meeting.

This was all the business.

JAMES HENDERSON, Hon. Sec. and Treas.

DESCRIPTION OF PLATE.

Fig. 1.—Extensive tuberculous disease of udder. Compare normal udder on right.
Fig. 2.—Tubercle bacilli in *unmixed milk* × 1000.
Fig. 3.—Tubercle bacilli in *mixed milk* × 1000.
Fig. 4.—Tubercle bacilli in sputum of cow affected with lung tuberculosis × 1000.
Fig. 5.—Tuberculous cervical glands removed from child 11 months old. Deep cervical chain of glands extensively involved.
Fig. 6.—Tuberculous cervical glands from child 10 years of age. Extensive infection of deep cervical glands.

SOUTH EASTERN VETERINARY MEDICAL ASSOCIATION.

[NATIONAL V.M.A.—SOUTHERN BRANCH].

MEETING OF VETERINARY INSPECTORS' SECTION AT CANTERBURY.

A special meeting of the Inspectors' Section was held at the County Hotel, Canterbury, on Thursday, June 11, for the purpose of discussing the working of the swine fever regulations and the question of valuing and the compensation paid under the Tuberculosis Order. In the temporary absence of the President (Mr. E. Lyne Dixson), the Vice-President (Mr. James Crowhurst) presided, and there were also present:—Messrs. E. Lyne-Dixson, President, Margate ; J. Crowhurst (F), and W. H. Crowhurst (F), Canterbury ; J. H. Ripley, Hurst Green ; G. Fordham, Ashford ; J. F. Hogben, Ash ; F. C. Golden, Folkestone ; P. Gregory, Tonbridge; E. Morgan, Faversham ; Charles Morgan, Nonington; W. Caudwell, Chertsey ; A. C. Burton, Battle ; Elmer Ebbetts, Rochester ; Charles Roberts, Tunbridge Wells ; and T. C. Toope, Dover, hon. sec.

Letters and telegrams regretting inability to be present were received from Messrs. E. W. Morris, J. B. Dier, T. Hibbard, W. W. Gulleford, J. Washford, F. Robards, and Cecil Crowhurst.

A deputation of the Canterbury Farmers' Club and East Kent Chamber of Agriculture, consisting of Mr. D. Brice, Dr. Vipan, and Mr. E. L. Gardener, was present and was welcomed by Mr. Crowhurst, who said the object of the meeting was of considerable importance ; they were anxious to ally themselves with a very important body, the Canterbury Farmers' Club and the East Kent Chamber of Agriculture. They believed if they could combine in going to the Board of Agriculture they might be able to show the authorities how that question of swine fever might be dealt with in a more practical way than it had been in the past. They also hoped to be able to show that the compensation paid under the Tuberculosis Order was most unfair.

The SECRETARY having read letters from members who were unfortunately prevented from attending, said the object of the meeting, as Mr. Crowhurst had ex-

plained, was to see if it were possible to come to some decision with regard to approaching the Board of Agriculture on the present conditions (which some of them claimed to be an abominable waste of public money) of the Swine Fever Order as at present worked. He was sure it would be to their advantage to hear the opinions of those gentlemen present who were members of the agricultural profession—one which was much older than the veterinary profession. The question would arise whether, conjointly with the Canterbury Farmers' Club and East Kent Chamber of Agriculture they should approach the President of the Board of Agriculture upon the present method of carrying out the Order.

Mr. W. H. CROWHURST proposed that the expenses for stamping out infectious diseases of animals be paid by the Government out of Imperial funds, as the benefit derived would be greater to the consumer than to the producer. The producer would render more assistance if he had not to bear the expense of stamping out disease. It was very necessary to get the support of the people who owned the animals, but if they could make more money in another way they would do it. It was to the advantage of the consumer that disease in animals should be stamped out, and he thought the consumers should bear the expense.

He considered that the Board went the wrong way to work to stamp out swine fever by killing all the pigs when there were only one or two bad and in the early stage. He had been to cases and killed one pig and the disease had not spread at all, even when there were hundreds around. He believed the expense of killing the lot would beat anybody, and that the country had got tired of it. At the present time the lay inspectors went round and told the owners what to do, and rode over the veterinary inspectors. He believed it was better to kill all the diseased animals and to keep the others in quarantine for some weeks. If a fair compensation were paid, say three-fourths, it would be an inducement to the farmer to give notice early, otherwise he would not kill the pigs but do the best he could with them, and thus spread disease.

[The President (Mr. Dixson) had now arrived, and succeeded Mr. Crowhurst in the chair.]

Mr. DIXSON said that meeting was the outcome of a letter he received from Mr. Toope stating that there was to be a meeting of the Canterbury Farmers' Club and East Kent Chamber of Agriculture, with the idea of forming a deputation to wait on the Minister of Agriculture to ask him to adjust certain grievances that existed in agricultural circles, and he thought, as did Mr. Crowhurst, that it would be a good opportunity for their veterinary association to join the Farmers' Club in that matter and to be represented on that deputation. With regard to swine fever, he did not think any one of them need be told that the disease did not in any way become lessened but rather that it increased under present conditions.

Mr. C. MORGAN said he considered the only way to stamp out swine fever was to put an embargo on the movements of store pigs for a certain time. He had known pigs to carry disease for twelve months. They were carriers of disease if they had been in contact. He believed if the markets for store pigs were shut up for a certain time that it would go a long way to stamp out the disease. He did not think swine fever could be entirely done away with, but he believed it could be stopped to a large extent. Where did they get the disease from? From the different markets. The store pigs went to market and then away and spread the disease.

Mr. EBBETTS said he considered the root of the trouble was that when there was an outbreak the Board killed some of the pigs and let others go. He knew a case where there were twenty pigs, of which several were affected, and the Board's inspector came down and did not have any killed. The pigs kept dying. In his opinion directly they were sure there was swine fever every pig that showed any signs of disease, or had been in contact, ought to be killed. Closing markets when there was an outbreak was a very good thing, but he thought the pigs should be stopped before they had the chance of getting to market.

Mr. CAUDWELL said he was much in sympathy with the statement of the last speaker—that the Board of Agriculture made a great mistake in not being more drastic. They knew that swine fever had been scheduled since 1878. Now the disease was just as prevalent as it had been at any time during the last fifty years. It seemed to him the Board had played shuttlecock in that matter, at one period slaughtering off all the pigs and at another time allowing them to die off like flies, and letting the disease drag on for months and months until it was pitiable to see the little animals walking about in such a sad condition. Mr. Caudwell instanced a case he had been called to during the past three weeks where a man bought some pigs that developed illness, and in adjoining sties there were ten or twelve little pigs. Four of the pigs died, and he made a post-mortem examination which showed lesions of swine fever. He recommended the owner to report the case and he did so, and the Board of Agriculture took away a portion of the bowel. The young man eventually declared it was swine fever, but no attempt had been made to wipe out the other pigs, they were allowed to remain until the healthy ones had got affected, and practically the whole lot had died since. He considered the Board ought to adopt more drastic measures and compensate the owner for the loss. The pigs ought to be slaughtered on the premises. In the pedigree herd it was a different matter, but seldom a pedigree herd gave them any trouble. They all knew that if the measures advocated by Sir George Brown had been carried into effect there would possibly be no such thing as swine fever to-day. The Board from time to time thought they had found the organism of swine fever, but now they admitted they were wrong. Other diseases had been stamped out without finding the organisms. There were plenty of diseases such as anthrax and glanders where the germ had been known for years, and yet had not been stamped out. He did not see the need of stopping to find the organism. They frequently found swine erysipelas, but the Board did not treat that as swine fever. He did not know why they did not, but if they were going to deal with swine fever in a drastic manner it would cost but little more to deal with that at the same time. He considered the two should be dealt with together.

With regard to the movement of pigs, no doubt most of the outbreaks were attributable to the movements from markets. He was strongly of opinion that the Board of Agriculture made a great mistake in taking swine fever inspectorship out of the hands of the local authorities. He believed the sooner the work reverted to the local authority the better. The district inspector was one of the best able to deal with it quickly and effectually, and he could also make his enquiries just the same as the Board of Agriculture's inspector could. Then, again, the disease was just as common among the pigs of small owners and farm labourers, and if a census were taken he believed the greater number of outbreaks would be found to be among the poorer owners. It was a great loss to them if they lost their pigs, owners as well as to the consumers of bacon.

Mr. HOGBEN (Ash) said he agreed with Mr. Caudwell's remarks that it would be much better if the Board reverted to the old system and employed the local practitioner who could deal with the cases more expeditiously. He thought, too, that swine erysipelas should be scheduled as well as swine fever.

Mr. GREGORY said he agreed with Mr. Ebbetts when he said the Board allowed the cases to go on too long. The Board had dispensed with the local practitioners and had treated them in an unprofessional and discourteous manner, but he thought after the Board had had the fair trial they had, any fair minded man must say that they had ignominously failed. If under any circumstances there could be any common-sense in anything connected with the Government they ought to admit themselves beaten and adopt other methods. He believed if they left that matter in the hands of the local authority that not only a great expense would be saved, but that a great number of cases would be prevented from spreading. Sometimes it was weeks after notice was given before any notice was taken by the Board, and it was seldom under three days before any restrictions were applied at all.

Mr. J. CROWHURST said the lay inspectors who had the power in their hands to surpress and stamp out swine fever had failed to do that in every way. They were not practical and had no reasonable mode of procedure. In dealing with disinfection, he knew where one inspector ordered three loads of lime where there were fifteen pigs! The disinfectants cost £1. In allotment gardens he found a lot of small owners of pigs, and generally railway sleepers were put down for the pigs to lie on, but the inspector never took up the sleepers; we all know that urine percolates through to the soil. Rats were great carriers of the disease. If the inspectors were to put the pigs on fresh ground he thought they were more likely to stamp out the disease. Regarding the conveyance and spread of the disease, he agreed it was by the store pigs in the market, where an inspector had no opportunity whatever of spotting the pigs contaminated with swine fever until they showed evidence that they were ill. He would advocate that there be no pig dealers; or, if they were allowed, they ought to be licensed, because they were the people they had less control over than any. They often carted diseased animals away and put a few here and a few there, and in that way they spread the disease far and wide. If that Association and the Farmers' Club could bring before the Minister of Agriculture a practical plan for stamping out swine fever they would be doing considerable good. At the present time the power was taken out of the hands of the veterinary surgeon and placed in the hands of the lay inspector, but he was positive they would never stamp out the disease with the present mode of procedure. That day they wanted to come to some decision as to what they would recommend, and he believed the Board would listen to them favourably, because when he was before the Diseases Committee and recommended having an inner zone they adopted the suggestion, and now said it worked well.

Mr. GREGORY said he could go at any time and buy pigs privately from a man who owned a thousand pigs, but if he wanted to sell two by auction he could not take them without the certificate of the veterinary inspector.

Mr. C. MORGAN asked Mr. James Crowhurst whether he advocated putting the police in the place of the lay inspectors, because he knew farmers had great objection to the police. The lay inspectors were not experts and only had to carry out the Order.

Mr. J. CROWHURST said he certainly should not advocate putting the work in the hands of the police. He believed that would only be going further and faring worse. He would put the duties in the hands of the local veterinary inspectors who were gentlemen fully capable of doing the work and had the confidence of the owners.

Mr. TOOPE said he agreed with a great part of what had been said, but there was one aspect that struck him very forcibly—the view the farmer took of the lay inspector. His own experience was that the farmer detested the lay inspector as much as he did the policeman, whereas he had little or no objection to the veterinary surgeon being on his place. He was absolutely certain of the fact—that large numbers of cases of swine fever and other contagious diseases were not reported for fear of being policed to death. His own experience of swine fever extended back to two years before he became a veterinary surgeon. For a great many years in Yorkshire he had to deal under the old *régime* with some hundreds of cases of swine fever, and he had little difficulty with the owners of animals because a just compensation was given by the Yorkshire authorities, and a very satisfactory result ensued. The West Riding authorities felt it was fair to compensate owners for the animals destroyed. If possible they did without wholesale destruction of contact animals. The present system of destroying some of the diseased and leaving others was a mistake from beginning to end. Further, he was unable to understand by what means the authorities came to the conclusions they did. In one case within the last two years some animals fed with wash from the barracks were stated to be suffering from swine fever. He was aware they were suffering from salt poisoning. They were killed and there were no signs of swine fever in any of them. In another case where he learnt the source of the swine fever from a private client, and where several animals were affected, that was declared not to be swine fever at all. Every pig died, but they took several weeks or a month to die, and the place remained a source of infection during that month or more. They could safely conclude that the methods adopted by the Board of Agriculture were not by any means certain. There was one other point he wished to make with regard to the local veterinary inspector doing the work of both the lay inspector and the Government inspector. As a rule the local veterinary inspector was a man of long experience who had the confidence of his clients, whereas on the contrary the vast majority of the men sent out by the Board of Agriculture were young men and inexperienced in everything except this particular disease which they had in hand. The farmer therefore had little confidence in the veterinary inspector sent down by the Board of Agriculture. The Board had treated the veterinary surgeon with scant courtesy and with much less consideration. The Board would not even tell the veterinary surgeon whether the opinion he had formed was right or wrong—in fact ignored him altogether. They were met that day to discuss the question from the farmers' point of view as well as from the veterinary point of view and after all the veterinary profession was only the daughter profession to agriculture which was the oldest profession in the world.

The CHAIRMAN said years ago the veterinary surgeon occupied the position of local veterinary adviser in matters appertaining to contagious disease, but that had been altered during the last few years and they had been left in the dark except in their private capacity. The veterinary profession had a grievance. In his presidential address he referred to the relationship of the Board of Agriculture to the veterinary profession and said it was most unfair on private practitioners who had the interest of their profession at heart, and were desirous of co-operating with the Board of Agriculture in exterminating this disease, to be treated as they were treated. When called in they did their best and advised their client to report and then another veterinary surgeon was sent down to deal with the matter. He had not a word to say against any of the gentlemen who acted in that capacity, for they were perfectly capable of doing the work, but the local veterinary surgeons heard nothing afterwards as to the results of the opinion that they expressed. When he acted in the capacity he had a case he reported as suspected

swine fever, and he had no hesitation in his own mind, the Board negatived it, and said it was not swine fever. In an outbreak two or three months afterwards on the same farm the Board still said it was not swine fever. On a third outbreak the pigs were slaughtered; it was found that it was a case of swine fever. He had not the slightest doubt that it was swine fever all the time. It was not right that when they of long experience wished to co-operate in exterminating the disease they should be treated with such scant courtesy, in fact it was nothing short of disgraceful, and they ought to resent it. He should be willing to act as one of a deputation to the Minister of Agriculture to lay the views of the meeting before him.

Dr. VIPAN, a prominent member of the Canterbury Farmers' Club and East Kent Chamber of Agriculture, thanked the Association for inviting a deputation of the Farmers' Club to that meeting to listen to the debate in order to find some way to meet that difficulty from the veterinary surgeons' point of view and also from the farmers' general point of view. Being a medical man, said Dr. Vipan, it had fallen to his lot to take more interest in that matter of swine fever than many other people had. Before he finished he would like to ask one or two questions from them as practical men, as they knew about the matter and he did not. He had to ask advice from them in order to guide him on some of those matters. It appears to him from what he had heard that considerable difficulty had arisen between them and the Agricultural Board. In the first place there seemed to be a difficulty in determining positively and absolutely that it was swine fever. He might be wrong, but that was what had struck him, because the Chairman had stated that the Board of Agriculture had declared in one case that there was no swine fever and that after several outbreaks of the same thing they had declared it was swine fever. He did not know but he was under the impression that these bacilli could be found at a very early date. If the disease was the same as they knew in the medical profession, such as in typhoid, time must elapse before the microscopical examinations could be sworn to. If that was so there must be some difficulty. As farmers they were not at all satisfied with the present condition of things, because they were put to enormous expense for no benefit whatever. They thought the time had come when they were forced to say something because they were dissatisfied with the whole working of the Swine Fever Order. That being so the question was how were they to remedy the matter. He thought the suggestion thrown out by the Chairman that a deputation should be organised and that they should appeal to the Board of Agriculture was a good one, but if it was, as had been hinted, the Board of Agriculture did not seem inclined to hear anything and that they turned a deaf ear to what they did say, for when there had been differences of opinion between their profession and the Board, the Board did not tell them where they were right or wring. They did not say that they ought to have discovered this thing or that—they had not discovered it. They did not give them definite proof whereby they could improve the condition of things—or their knowledge. He thought that with such a large and expensive Board, having the greatest veterinary surgeons at their hands, it was at least their duty, if they knew any more than the local veterinary surgeons, to give them the benefit of what they knew and try to point out to them where they were wrong. That was what was done in the medical profession.

The farmer had great reliance in the veterinary surgeon and looked to him very much as his friend in that matter. He trusted very much to him, but of course they knew that very many farmers were not so well educated as others, and they had their own ideas about swine fever. The difficulty, however, was that a farmer called in a veterinary surgeon who told him there was no swine fever, and then an inspector came down and said it was swine fever, or *vice versa*. That was rather conflicting to an uneducated man, but, personally, he agreed entirely that the power should be put in the hands of veterinary surgeons in the same way as medical surgeons had. There was no Board to dictate to the surgeon, then why should the veterinary surgeon be dictated to? They had passed their curriculum and paid their fees upon becoming veterinary surgeons, and they ought to have some Veterinary Medical Board where they could submit their cases to have determined which was right and which was wrong. In the medical profession they could submit cases to their Council, but they were not dictated to by the Government as to what they were to do and what they were not to do. They had received from the Crown the power to sign certificates of death, and veterinary surgeons had received from the Crown power to sign certificates of disease. He would like to know if anyone could tell him if a bacillus existed, and how long the bacillus was supposed to survive. Did it die out in three weeks, or a month, or six weeks, or could it live on in the skin of animals for months? One gentleman said he knew the disease to break out three months afterwards. He saw in a medical paper a few days previously a rather curious thing which opened his eyes, the writer stating that it was propagated by contagion of the skin of one pig to another, but not so much by the fæces and breath as was originally understood to be the case. He always understood it arose from the excreta and the breath, but this man put a new idea on it, stating that it originated by contagion from the skin itself. He (Dr. Vipan's) opinion was that more power should be given to the veterinary surgeon to close premises or adopt what means and what measures he desired. He did not think the Board of Agriculture was a bit of use whatever. He had had swine fever on his farms and had seen the way the Board's inspectors acted. They had had many debates at the Farmers' Club during the past twenty years, and with regard to swine fever they did not seem any nearer eradication than in the days when he first attended the Club meetings. At the Club the members felt strongly, and he had heard it advocated over and over again, that the expense was so great and that it ought not to be borne by the local authority, to which farmers had to pay the highest amount of anyone. They did not think it fair or just to the farmer or to the consumer that it should be borne by the local authority. They were of opinion that it should be borne by the Imperial Exchequer. He fully agreed with Mr. W. H. Crowhurst's proposal on that point.

Mr D. BRICE, Vice-chairman of the local Chamber of Agriculture, said he had had a good deal of experience in trying to help the different inspectors in stamping out the disease when it occurred on his premises, and the last time he had an outbreak he was so disgusted with the way in which the work was carried out that he told the inspector he would never have to come to his premises any more. He said he would get rid of the disease by declining to keep any more pigs. He had killed them all and had never had to send for an inspector since. (Laughter.) For thirty years they had seen attempts made to stamp out the disease, but what did they see happened?—it was as prevalent as ever. They looked upon pork as the food of man in the same way as they looked upon beef and mutton as the food of man. What happened? A district was isolated and a certain quantity of animals were killed, but having tried for so many years to stamp out the disease without the least success was it impossible to try to persuade the Board of Agriculture to launch out and give a trial in another direction? He presumed they had all the best veterinary inspectors at their beck and call. Surely in all this time something could have been found

to eradicate the disease, for an outbreak of disease brought with it a great loss. He had listened to the remarks made that day with great interest and he could not help feeling that that meeting of veterinary surgeons could put their heads together and devise some effective scheme, because they understood the matter as farmers could not be expected to. Veterinary surgeons understood it, or why did farmers send for the local veterinary surgeons when they got anything the matter? It was because they had confidence in them that they could deal with the disease. Having that confidence in them he was sure they would form a deputation to be sent to the Board of Agriculture, and even if the Board took no notice of them they would at least feel they had done their duty to the country. He would be pleased to support them at the Farmers' Club as far as his ability allowed him in forming that deputation, and he trusted that good might come of it, because he was afraid until there was an alteration in procedure swine fever would never be got rid of or much diminished. Bullocks were promptly killed to get rid of disease, but with diseased pigs, according to the remarks that had been made, they allowed them to run about as if of no value, and if it was of no consequence whether they were killed to-day, or to-morrow, or next week.

Mr. E. L. GARDENER, Secretary of the Farmers' Club, extended a cordial welcome to the Association to send representatives to the Farmers' Club meeting on the 20th inst., when he was sure they would receive the sympathy and support of the Club, and he trusted good might come of the discussion that would take place.

The PRESIDENT, replying to Dr. Vipan's questions, said he did not think the Board of Agriculture, or veterinary surgeons, or inspectors knew the exact length of time the disease might lie about dormant and then break out afresh. It seemed to be interminable. As to whether the disease could be spread by one pig coming in contact with the skin of another pig, that was the first time he had heard that suggestion that the skin might cause it. It had always been held that it was spread through the excreta or the breath. He did want them to take his opinion although, because there were other experienced men in the room who perhaps could enlighten them on the subject.

Mr. TOOPE said, in reply to Dr. Vipen, that although two or three organisms had been found associated with swine fever, neither had been proved to be the causal organism. They had failed to produce the disease after isolation and cultivation—they were probably secondary invaders. The causal organism, or whatever it may be, was ultra-microscopic and filterable—a virus similar in characteristics to that of rinderpest or foot-and-mouth disease, retaining its virulency for many weeks when moist. Such, at least, was the latest statement he had read respecting it.

Mr. MORGAN (Faversham) gave details of a case that had come under his notice where sows in pig had been bought and were on the premises four months, and three weeks after they had their pigs they developed swine fever. When a post-mortem was made they were all rotten with the disease. The disease must have laid dormant during the conception period.

Mr. J. CROWHURST said swine fever was not only a contagious but an infectious disease, and they need not think about the skin specially at all. The excreta of the pigs became absorbed in the soil, and if the pigs were put on the same premises the disease was spread in that way. Rats, too, were very common where pigs were kept, and he believed they carried the disease from place to place often.

Mr. CAUDWELL said he believed no other animal suffered from the disease except pigs, but any animal may convey the virus from one place to another. As to the skin being capable of conveying the disease, the pig was liable to skin eruption in swine fever, and the scales might contain the virus. The Board had experimented with lice, thinking they could transfer it through them, but they had failed to convey it from a diseased pig to a healthy pig in that manner. He believed that the virus is conveyed by the fæces chiefly.

Mr. ROBERTS said, replying to Dr. Vipan, that although several organisms had at various times been thought to be responsible, none of them had yet been clearly proved to be the cause of the disease. Mr. Toope had made that clear. It was now thought to be a mixed infection, the presence of more than one variety of organism being essential for the production of the disease.

The skin of the pig was sometimes the seat of ulceration. He had some photographs of the head of a pig, which he had taken after death, which showed some characteristic swine fever ulcers. If a healthy pig came into contact with such ulcers, it might contract the disease, not by absorption through its own skin, but by swallowing the virus.

As to the time the virus remained about a place, he remembered one premises which, after slaughter of all the pigs and the carrying out of fairly thorough disinfection, remained empty for twelve months, and yet when new pigs were brought from what was believed to be a healthy source, the disease broke out again in a few weeks. Of course that is not conclusive, but there was a strong suspicion that the virus had remained about the styes from the previous outbreak.

Anyone who had given any thought at all to the question of swine fever, respecting its present prevalence compared with that of a few years ago, must have been puzzled, and must have wondered whether the Board of Agriculture were at fault, or whether it was the unmanageable character of the disease that baffled those who were engaged in dealing with it. The Board's methods were not ideal, and were not always promptly carried out. No doubt it understood the nature of the disease, but one wondered sometimes if it assigned this important work to its most competent men. Could it be that it left it to its younger and less experienced officers? Its diagnoses sometimes apparently were quite opposed to those of experienced men in the provinces. When opinions were conflicting on such a matter, one was at a loss to know why. Could it be that they were undermanned at the Board and that somebody not conversant with swine fever had this matter in hand?

He would like to ask Mr. Caudwell and others if there was any difficulty in diagnosing the disease. They could not do it microscopically, but if the characteristic ulcers were present they were sure of it. There was, however, what was known as the diphtheritic lesion, which he believed left doubt in some minds, if no ulcers were present.

Their President mentioned the fact that the Board did not take provincial veterinary surgeons into its confidence, but rather hid their opinion of outbreaks from them. He (Mr. Roberts) did not think the Board had anything to keep from them, because as he had said, its officers thoroughly understood the disease; and, moreover, they all knew how it had dealt with other diseases by applying cattle-plague measures, and how it had very promptly stamped out cattle-plague and foot-and-mouth and other diseases. It was clear that the Board could rid the country of diseases, and for his own part he could not see why swine fever should not be eradicated in a few years if it were dealt with in a business-like way, although there were reasons why it was not so manageable as some of the cattle epizootics. He thought that generous compensation, complete slaughter, and thorough disinfection were the main factors in exterminating swine fever. Thorough disinfection was

a very important matter, and there was some doubt in his mind as to how far the laity understood it, although it was not difficult to master.

Mr. J. CROWHURST urged the meeting to form a deputation to lay before the Board a practical scheme for dealing with the disease. He believed from the remarks that had been made that they were all of the same opinion in the matter. The question of disinfection was one of the matters they ought to lay before the Board. Dealing more promptly with the disease, slaughter, and compensation were other points. He believed those were the chief points to lay before them. They were all honestly and seriously anxious to get rid of swine fever. They had stood by and seen how the Board had dealt with it in a most unbusinesslike way. It was for them to put before the Minister of Agriculture what they thought was the right procedure for stamping out the disease.

Mr. HOGBEN (Ash) seconded, and, in doing so, said it seemed to him from the discussion that it was the general opinion of the members that it was time the method of coping with swine fever was altered. He believed the old method of dealing with the disease by the local authority or by the local veterinary inspector was quicker, less costly, and that it prevented the spread of the disease more effectually than the roundabout methods of the Board.

The proposition was carried unanimously.

Mr. W. H. Crowhurst's motion, mentioned earlier in the meeting, was then put and carried.

The next business was to select the deputation.

Mr. TOOPE said they were a young body compared with the agriculturists, and he would like to see the latter body take the lead in the matter of the deputation. The Farmers' Club ought to have the ear of the Board of Agriculture better than that Association, and he would suggest that they appoint a deputation to attend the next meeting of the Farmers' Club and that the members sent to the meeting should also be the deputation to wait upon the Board of Agriculture conjointly with those gentlemen appointed by the Farmers' Club.

The meeting selected the President, the Secretary, Messrs. J. Crowhurst, Hogben (Ash), Caudwell, and Roberts to be the Association's representatives on the deputation.

The PRESIDENT said not less important was the question of the valuation clauses of the Tuberculosis Order, and he thought all of them who acted under the Tuberculosis Order must be fully aware of the widespread dissatisfaction which existed among all owners of stock. There was not the slightest inducement for an owner of a tuberculous animal to report the disease. His experience was that men who had had one experience of it told them blankly that it would be the last, for they would not report a case and receive a cheque for as low a sum of 30/- or £2 for a tuberculous cow. They would rather knock it on the head or dispose of it in some other way.

Mr. GREGORY said he had had 43 cases under the new Order. At first he found it went very well, in fact so far he had had no unpleasantness, but one could not disguise the fact that every word the President had said was absolutely true. Owners strongly objected to the low rate of compensation. With regard to the question of valuation all in the room had lately received a letter from Mr. Prosser, Clerk to the County Council, to say that they were not to value a cow upon its milking value, but they were to value her upon her value to the butcher.

The PRESIDENT: Which is *nil*.

Mr. GREGORY said a cow worth £24 or £25 to the dairyman would only be worth £12 to the butcher. It was a source of much annoyance to the owners of cows, and was manifestly unfair. It really did not make so much difference to the owner in the case of a dry cow, because if it was a tuberculous cow it had to be valued from a different point of view, but the difference was so great that it caused much dissatisfaction to put the milking cow's value so low.

Mr. J. CROWHURST said he considered the system of valuation was altogether wrong. They were asked to put on what they considered was the value in the first place as an inducement to the owner. To him it seemed to be a trick. If they valued an animal at £20 and it proved not to be suffering from tuberculosis then the owner was going to receive £1 more than the £20. It was well known that no veterinary surgeon who had the least experience would recommend the slaughter of cows that he was not absolutely certain were tuberculous. They had the opportunity of examination and of testing with tuberculin, and to dangle that £1 above the £20 before an owner seemed very false. Then the man had to be paid the second value if the animal was found to be suffering from tuberculosis, and then the authority stepped in and brought the value down to about 30/ or £2 ultimately. A letter had been sent to him complaining that he had valued too highly. One cow that he valued was giving a gallon and a half of milk and he considered there was a value to that, but the authority said "No, value it at what the butcher would give for it." In a case of emaciation there was no value to an animal. His conscience rebelled at the Order that where the glands were affected or the animal was only slightly affected they were to cut away the diseased portions and then recommend the rest of the animal to be sold for human food. He took a very strong view in that matter. Where they got re-action with tuberculin he was not sure that the animal was wholesome food. The protection was from cooking, but the inference to be drawn was that the poor man could eat it. A working man earning 18/- a week worked hard for his living and when he went into a shop the butcher did not say "You can have this for twopence or threepence less because it is diseased." The working man was charged the full price and he took the meat home for his family. That was a false position to place any valuer in, and he did not recommend such meat for human food, and was not going to when the animal reacted with tuberculin.

Mr. EBBETTS said he considered the two valuations a great mistake. To his mind only one valuation was needed, the valuation of the animal as it stood. He did not see the advantage of making two valuations which were only misleading to the owner. He had a case where a great fat cow had tuberculosis of the udder, but she was sound everywhere else and they were not allowed to condemn a carcase like that. They must pass her, according to the regulations of the Board. If the whole carcase was to be condemned they would hardly have any meat passed at all.

Mr. J. CROWHURST said when tuberculin reacted, was not the tuberculosis organism in the blood and extended over the whole of the carcase or was it centred in one particular part? He did not think the latter was the case.

Mr. TOOPE said it was highly probable that the intervention of tuberculin might in some cases, by breaking down lesions, generalise a case of tuberculosis, which prior to its use was purely local in character; it, however, did not always follow a reaction.

The PRESIDENT said he represented a health resort, Margate, and his sanitary committee would not under any condition allow any part of a carcase of an animal that re-acted to tuberculin to be used for human food. The carcases of such animals were burnt in the dust destructor. His committee said Margate was a health resort and it did not matter what the Board of Agri-

culture said. He knew at Islington certain portions of carcases were passed. The use of portions of a carcase in that way was permitted by the Government.

Mr. W. H. CROWHURST said if butchers sold diseased meat they were prosecuted: why, then, should the Board of Agriculture say they could cut off diseased parts of a carcase and sell the rest?

The PRESIDENT said if there was any doubt they ought to err on the right side.

Mr. D. BRICE said he had known Mr. James Crowhurst for many years, and he was a man in whose opinion he had every trust. He was glad to hear the remarks of the President in regard to Margate not allowing any diseased meat in the borough if they knew of it. He lived in the days gone by when the regulations were not so strict, and he could take his memory back to what used to happen, but he did not advocate it. When the authorities were going to so much expense in providing sanatoria to make these islands healthy he thought it was bad taste to let diseased meat come within the reach of the public.

Mr. GREGORY: Can you tell us where the sanatoria are? (Laughter.)

Mr. BRICE said if they lived a few years he believed they would know by the rates. Let them "wait and see." If it was really dangerous—if that food would convey disease to the public, he did think the veterinary profession should be the authority to say that certain meat was good or that it could be used for human consumption.

Dr. VIPAN said that day Mr. James Crowhurst had only endorsed what he had said at the Farmers' Club on many occasions, and he (Dr. Vipan) had always supported him through thick and thin in what he had said on that question, for he agreed entirely with what Mr. Crowhurst had said. There were, however, a few questions that he would like to put before the meeting from a medical point of view. He could not conceive if they had tuberculosis of the udder and of its lymphatic gland that in all probability there was not tuberculosis in other parts of the body. They might say that on making a post-mortem examination they did not find it, but the probability was they did not go far enough. To his mind it was highly probable if they examined some of the lymphatics in front of the spine they would find them infected with some tuberculous deposit. They found it in the human subject, and if that was so why did they not find it in the bovine subject. Some years ago cancerous disease was thought to be local, but now they knew from extensive research that in nearly all the cases if it was of the recurrent character they found it in the marrow of the bones by microscopical examination. Reasoning from analogy, he thought in all probability they would find tuberculosis in other parts of the body, but perhaps science had not reached so far as to enable them to trace it. Whether it was so or not, he contended they were playing with a dangerous thing, and they had no right to say that an animal had tuberculosis, but that certain parts could be used for human food. When Mr. Crowhurst explained that, he (Dr. Vipan) was astonished and he never could believe that such a high Government as we professed to have in this country could be a party to allowing any food which was unfit, because the animal was tuberculous, to be eaten by the public. To allow that seemed to be absolutely wrong. They as farmers and as humanitarians should make themselves heard in that matter. What would the poor people of this country say if they knew it? Did they know that certain meat came from tuberculous cows? If the public knew it they would say they were not going to eat tuberculous meat. They as a profession and as humanitarians should strongly protest against that matter, and they ought to make it a public matter. If they let the public know they would soon decide it. Unless they make that a public matter they would not do their duty.

He could not think it was fair that they should have two valuations. If they were to put a value on a cow, let them not put a butcher's price on it. Putting a butcher's price on a cow meant a serious loss to the owner. There was no doubt the present laws wanted a great deal of improving. They considered the value ought to be put considerably higher. On behalf of the farmers he thanked the Veterinary Association for the interest they were taking in that matter, and said he was sure the Farmers' Club would support them in bringing the matter before the Board of Agriculture.

In reply to Mr. Gregory, Dr. Vipan said he did not believe in the hereditary principle, but there was a certain pre-disposition whereby certain animals would take the disease whereas others would never take it.

Mr HOGBEN (Ash) referred to the number of beasts that went into butchers' shops and were slaughtered without any inspection, and he believed the disease was more prevalent than they thought it was.

The PRESIDENT said that only proved the need for the abolition of the private slaughterhouses.

Mr. TOOPE proposed a vote of thanks to the deputation from the Farmers' Club who had attended the meeting, for giving them the advantage of their experience, and remarked that that was one of the first occasions on which the veterinary profession and the agricultural profession had met on common lines.

Mr. HOGBEN (Ash) seconded, and the vote of thanks was carried by acclamation, Dr. Vipan acknowledging the compliment.

A vote of thanks to Mr. Dixson for presiding closed a very interesting meeting.

THEO. C. TOOPE, Hon. Sec.

SOUTH DURHAM AND NORTH YORKSHIRE VETERINARY MEDICAL ASSOCIATION

[NATIONAL V.M.A.—NORTHERN BRANCH].

A meeting was held in the Imperial Hotel, Darlington, on Friday, June 5th. Mr. J. M. Walker, Hartlepool, President, in the chair. There were also present: Messrs. G. R. Dudgeon, Sunderland; E. H. Pratt, Northallerton; T. Wilkinson, Lanchester: A. G. K. Brittain, Guisbro'; A. C. Forbes, Bishop Auckland; R. Barker, Stockton-on-Tees; F. H. Sanderson, and J. H. Taylor, Darlington.

Visitors: Messrs. G. H. Petch, M.R.C.V.S., Durham, and G. C. Scott, F.C.S., F.I.C., India.

Mr. DUDGEON proposed, seconded by Mr. Wilkinson, and carried, that the minutes of the previous meeting as they had appeared in *The Veterinary Record* be taken as read and confirmed.

New Members. Mr. J. W. RIDER, Beamish, was elected a member of the Association on the proposition of Mr. Dudgeon, seconded by Mr. Wilkinson.

Mr. G. H. PETCH, Durham, was nominated on the proposition of Mr. Sanderson, seconded by the Secretary.

Correspondence. Apologies for non-attendance were received from Messrs. W. N. Dobbing and P. B. Riley.

The SECRETARY stated that a few days after their last meeting in March he received a letter from the President R.C.V.S., enclosing forms of petition to the Treasury for a pension to the children of the late William Hunting. He thereupon wrote to Mr. Carter pointing out that their quarterly meeting had just taken place, and asked him what he would suggest being done in the matter. In a few days he received a letter from Mr. Henry Gray suggesting that the President and Secretary of the Association sign the petition before the next meeting and then at the June meeting

get the approval of the members. He then sent the petition to their President, Mr. Walker, and he signed it, and tried to get the signature of the M.P. for the Hartlepools, but he was away from home. He (the Secretary) then signed it and got the signature of the M.O.H. for Darlington, and sent the petition to Mr. Gray, and he would now like to have the feeling of the members as to whether what the President and he had done met with their approval.

Mr. PRATT: I propose that we entirely approve of the signing of the petition on our behalf, and endorse the action which has been taken in the matter.

Mr. DUDGEON: I beg to second that, and in doing so might say that I knew the late William Hunting since I was a child, longer than any person in this room, and I hope that a pension may be granted to his children.

The motion on being put to the meeting was carried unanimously.

An urgent appeal was read from Mr. W. Shipley on behalf of the Victoria Veterinary Benevolent Fund which reminded the Association that its subscription was now due, and expressed a hope that each individual member would subscribe.

The PRESIDENT proposed, seconded by Mr. Pratt, and carried, that the annual subscription of £2 2s. be sent.

Mr. DUDGEON stated that he was quite in sympathy with the sending of the amount, but it seemed to him a mistake that they should have two societies doing benevolent work. He was a subscriber to the National Veterinary Benevolent and Defence Association which, as its name stated, undertook defence work in addition to that of benevolence, and it seemed a pity these Associations were not united to make one strong body.

Two or three other members appearing to be of the same opinion the Secretary said that he would mention what had been said when he sent their subscription to Mr. Shipley.

A letter from Sir S. Stockman, honorary secretary to the Tenth International Veterinary Congress, expressing a hope that the Society would appoint one of its members to represent it at the Congress to be held in London from the 3rd to the 8th August.

The PRESIDENT said they were aware that at their last meeting he had been appointed to represent them at the Congress of the Royal Sanitary Institute to be held at Blackpool in July, but to his mind the Veterinary Congress was far more important, and he would like to hear their views on the matter.

Mr. SANDERSON thought that it would be better if the President went to London instead of to Blackpool, and he proposed that this be done.

Mr. DUDGEON said that he was in agreement with Mr. Sanderson. Personally he would like the Association to be represented at both places, but thought that perhaps Mr. Walker could not manage that.

Mr. WALKER said that he was afraid that he could not attend both meetings, but would try and attend one of them.

After discussion, it was unanimously agreed that the President attend the London Congress in any case, but both if he could, and that if he found himself unable to do so, that the Secretary should go in his place to the London Congress.

The SECRETARY read a letter from Mr. Awde resigning his membership of the Association. He further said that he had written to Mr. Awde asking him to reconsider his intention of resigning, as he felt sure that he was only voicing the feelings of all the members when he said that his resignation would be received with general feelings of regret. Mr. Awde was one of the oldest members of the Association, and he (the Secretary) was quite sure that if it had not been for the hard work Mr. Awde had put in, that Association would not be in existence now.

Mr. FORBES said that he was not present at the last meeting, and therefore knew nothing of what took place then to cause Mr. Awde to resign. He thought it was a great pity that Mr. Awde should resign, and that the resignation should not be accepted until the President or Secretary had seen him and asked him to reconsider the matter, and he proposed that this course be adopted.

Mr. PRATT said he would second that, as he considered it a great pity for Mr. Awde to resign, especially as he had been a member so long, and as just lately we were getting some new members.

Mr. DUDGEON said that this resignation came to him as a great surprise, for after their last meeting Mr. Awde promised to provide a paper for this meeting. Mr. Awde had indeed been the chief support of the Association and had undoubtedly made it a success, and he knew of no reason why he should resign. There was perhaps a little "hammer and tongs" at the last meeting, and perhaps he was the man who hammered. He was, however, quite convinced that he took up a reasonable attitude about what took place with reference to the election of a member, and he hoped it was nothing he had said that had made Mr. Awde resign. He was quite sure that he had only spoken on the broad principles which ought to govern such Associations as theirs. He liked a fair fight and a square fight, and if they were going to appoint anybody to see Mr. Awde he hoped they would point out to him that if he (Mr. Dudgeon) had said anything that had caused annoyance, he would unreservedly withdraw it, and he had pleasure in supporting the resolution that Mr. Awde be asked to reconsider his resignation.

The resolution proposed by Mr. Forbes, and seconded by Mr. Pratt, was unanimously carried.

MALFORMATION IN A CALF.

Mr. SANDERSON showed a photo of a calf monstrosity which had occurred in his practice. He was called one morning about five o'clock to calve a cow. The owner had been at work about an hour and a half before he arrived. On making his examination he found four legs presented and two heads. He tried to separate the legs, but found that when he tried to push one head and two forelegs back, and bring the other head and forelegs forward, he got no success. After working nearly two hours he advised slaughter. The cow was killed and the monstrosity lived for half an hour after being taken from the cow. The calf was now seen to possess two complete heads and necks, six legs (four forelegs and two hind legs) two tails, one abdomen and thorax, and one set of internal organs.

Annual Excursion. It was proposed by Mr. Dudgeon, seconded by Mr. Walker and carried, that the members and their friends have an excursion this year, and that the arrangements for it left in the hands of Messrs. Dobbing, Hill, and the Secretary.

ELECTION OF OFFICERS.

Mr. PRATT proposed that Mr. Forbes be the President for next year.

Mr. FORBES declined, saying that he appreciated the proposed honour very much, but it was only a few years since he occupied that position, and he would rather somebody else was elected.

Mr. DUDGEON suggested that as Mr. Forbes had declined to stand it might be well to re-elect Mr. Walker, and thus show him that he had the confidence of the members.

The following were then elected:

President. Mr. J. M. WALKER, F.R.C.V.S., West Hartlepool; proposed by Mr. Sanderson, seconded by Mr. Wilkinson.

Vice-Presidents. Mr. W. AWDE, F.R.C.V.S., Stockton-on-Tees; Mr. W. N. DOBBING, M.R.C.V.S., Darlington; proposed by Mr. Dudgeon, seconded by Mr. Pratt.

Hon. Sec. and Treas. Mr. J. H. TAYLOR, F.R.C.V.S., Darlington; proposed by Mr. Dudgeon, seconded by Mr. Sanderson.

Auditors. Messrs. DOBBING and HILL; proposed by Mr. Forbes, seconded by Mr. Dudgeon.

It was pointed out that as Mr. Awde had resigned his membership, it was hardly in order to elect him as a Vice-president.

Mr. DUDGEON thought the election ought to stand, or he was sure all the members would wish that Mr. Awde would continue his membership of the Association. It was thereupon generally agreed that the election should remain.

FEES PAID BY INSURANCE COMPANIES TO VETERINARY SURGEONS.

The SECRETARY stated that he had received two circular letters and a copy of scale of fees from Mr. Toope.

Mr. FORBES thought that before the fees paid by insurance companies were criticised the veterinary profession should put its own house in order. For instance, some veterinary surgeons castrated colts for 5/- a head, which in his opinion was far too small a fee, 10/6 being little enough. When he first came into the district he was surprised at some of the fees that were charged. He always undertook work for insurance companies if it was convenient for him to do so, and thought 3/6 or 4/6 for casually looking over a mare for insurance sufficient, but of course he would only do this if passing the place, and would not make a special journey.

Mr. DUDGEON was of opinion that veterinary surgeons could get what fees they liked if they only put their heads together, and the members of Associations were to blame if they did not act together and get more for their work. They in Sunderland had lately had a fight about better prices for shoeing, and the master farriers had formed a strong combination and got what they wanted.

For some years he had been in the habit of writing across all communications from Insurance Companies that he declined to work for the fee they offered. He had explained this to his clients, and had lost clients through it, for others had done the work he would not do, and got an introduction to his client in that way. One had usually 8 to 12 questions to answer about the animals to be insured, and he had no hesitation in saying, that a veterinary surgeon was not doing honest work in answering these questions for a fee such as was usually offered him.

Mr. WALKER said that sometimes one might get into trouble with one's clients if you did not go to examine a mare due to foal, and the mare died before the owner got the policy, on account of the other man who had been sent, not getting there in time.

Mr. PRATT said that he had had experience such as Mr. Walker had stated. If the veterinary surgeon demanded a larger fee for his examination, the Insurance Companies would have to increase their premiums, which in many cases might prevent the farmer insuring at all.

Mr. DUDGEON: You consider your clients too much, and the Insurance Companies know this and are trading on it. I think we ought to support the National in their attempt to raise the fees.

Mr. PRATT thought it would not do to bind the members to the proposed fees at present, but was willing to give the matter his support.

Mr. SANDERSON thought that if we gave the matter our support, the N.V.A. would inform the Insurance Companies officially what had been done, and then if they wished animals examined, they would have to pay veterinary surgeons better fees.

The SECRETARY said that he thought the Association ought to give the fees suggested by the N.V.A., all the support it could. For a long time now, his partner and self had only undertaken examinations when passing the places. Only recently, they had received notice to examine two horses, 12 miles away, for the fee of 7/6. He might say, that they had declined to do the work.

Mr. FORBES: That's just my way, I do it if it pays me, but decline if it does not.

Mr. PRATT proposed the following resolution, which was seconded by Mr. Forbes, and unanimously carried: "That having discussed the fees as suggested by the N.V.A., the Association does not bind itself to the proposed fees at present. It, however, approves of them and would use its best endeavours to obtain them".

It was agreed that the matter should be further discussed at the next meeting.

Time would not permit the reading of a paper on "The Tuberculosis Order, 1913" kindly provided by Mr. W. Awde.

It was proposed by Mr. Walker, seconded by Mr. Forbes and carried, that Mr. Awde be asked to come to the meeting and read his paper.

The members then had tea together in the hotel.

JAMES H. TAYLOR, Hon. Sec.

Ancient Beef.

For a few hours on Wednesday, June 10th, a large piece of frozen beef, eighteen years old, was on exhibition at the Central Markets, Smithfield. At present the beef belongs to Mr. Thomas Dunlop Young, M.R.C.V.S., Veterinary Inspector to the Corporation, who explained to a representative of the *City Press* how it came into his possession, and how it has been allowed to reach such a mature age before possible consumption. He said: "Mr. J. J. Rawlings, Meat Inspector at the Royal Naval Abattoirs in Malta, was present at the time when the Government took over Messrs. Wills and Co.'s store in that island. He then discovered that Messrs. Wills, for the sake of experiment, had kept in store since February, 1896, some quarters of frozen beef, which they received from Australia by the s.s. 'Portland.' Knowing that I am always interested in both the scientific and the practical side of meat inspection and refrigeration, he wrote to tell me what he had found, and promised to ship it to me if I so desired, and the meat was consigned to me by s.s. "Norfolk" last January. Mr. H. Spadaccini, Meat Inspector in the Port of London, kindly took charge of it, and had it sent to the Central Markets Cold Stores, where, through the kindness of the managing director, and the manager of the Stores, it has been kept until the present time."

Wednesday's brief exhibition was the result of a request made by Mr. George Goodsir, of the firm of W. Weddel and Co. In return for that favour to the trade, Mr. Goodsir defrayed the cost of photographing the meat from different points of view, and two of the photographs are reproduced. He also offered to pay for a scientific test, which will be undertaken by Dr. Rideal, who is the food inspector for the Meat Importers' Association. In reply to a question as to the condition of the meat, Mr. Dunlop Young replied: "It is not tainted or decayed. One question is as to the food value. Dr. Howarth and myself are greatly interested in that. We shall also try to ascertain how much longer the meat would keep."—*City Press.*

DISEASES OF ANIMALS ACTS 1894 TO 1911, SUMMARY OF RETURNS.

Period.	Anthrax		Foot-and-Mouth Disease.		Glanders.†		Parasitic Mange.		Sheep Scab.	Swine Fever.	
	Outbreaks (a)	Animals.	Outbreaks (a	Animals.	Outbreaks (b)	Animals.	Outbreaks (b)	Animals.	(b)	Outbreaks (a)	Slaughtered. *
GT. BRITAIN. Week ended June 27	7	9			3	9	34	50	2	92	1248
Corresponding week in 1913 ...	2	2			5	6	36	71		56	432
Corresponding week in 1912 ...	13	15	4	38	7	21	39	57		63	526
Corresponding week in 1911 ...	17	22			1	2			1	52	927
Total for 26 weeks, 1914	441	471	11	74	51	137	1391	2488	147	2188	22571
Corresponding period in 1913 ...	317	342			88	243	1659	3382	121	1230	17037
Corresponding period in 1912 ...	497	557	4	38	87	185	2100	4657	162	1797	22841
Corresponding period in 1911 ...	476	594	1	18	104	273			303	1332	14977

(a) Confirmed. (b) Reported by Local Authorities. † Counties affected, animals attacked: Essex 1, London 7, Middlesex 1.
Board of Agriculture and Fisheries, June 30, 1914

IRELAND. Week ended June 27	...	...	...	...	...	...	Outbreaks 1	5	1	28
Corresponding Week in 1913 ...	...	...	...	...	...	...	2	9	3	10
Corresponding Week in 1912 ...	...	...	...	...	...	...	2	2	4	30
Corresponding Week in 1911 ...	...	...	...	...	...	...	1	2	10	63
Total for 26 weeks, 1914 ...	1	1	75	953	...	...	49	347	116	642
Corresponding period in 1913 ...	...	...	...	...	...	...	92	319	85	509
Corresponding period in 1912 ...	2	2	...	...	...	...	45	257	137	1275
Corresponding period in 1911 ...	5	6	...	...	2	3	44	242	63	974

Department of Agriculture and Technical Instruction for Ireland, (Veterinary Branch), Dublin, June 29, 1914
NOTE.—The figures for the Current Year are approximate only. * As Diseased or Exposed to Infection

Personal.

Mr. S. LITTE, M.R.C.V.S., was Secretary of Show Committee at the Dungannon Agricultural Association's 12th Annual Show held on Wednesday, June 3.

Mr. GEO. C. INGLIS, M.R.C.V.S., Alloa, was judge of the Light Horse class at the Annual Show of the West Lothian Agricultural Society held in Bonnytoun Park, Linlithgow, on Friday, June 19.

Mr. W. F. HOUSTON, M.R.C.V.S., acted as judge of the Light Horse class at the Annual Show of Clackmannanshire Union Agricultural Society held in the Public Park, Alloa, on June 20.

Hunting Memorial Fund.

Subscriptions received up to 7 p.m., July 1st, 1914.

Amount previously acknowledged	316	2	0
Mr. John Nicol, G.V.S., King Williams' Town, Cape Colony, S. Africa.	10	0	
Royal Vety. Coll. V.M.A. (students only), per E. E. Jelbart, Hon. Sec.	5	5	0
Mr. Geo. Howie, Alford, Aberdeenshire	10	0	
West of Ireland V.A., per H. McConnell, The Mall, Armagh	2	2	0
	£324	9	0

HENRY GRAY, Hon. Sec. & Treas.
23 Upper Phillimore Place, London, W.

Cheques endorsed "Hunting Memorial Fund" and crossed "The London, City and Midland Bank, Ltd. Kensington High Street Branch.

OBITUARY

EUSEBIUS GUSTAVUS CROWHURST, F.R.C.V.S., Leamington. Graduated, Lond: April, 1863.

Mr. Crowhurst died at Leamington, from heart disease on June 26th. Aged 80 years.

ROBERT PEARSON, M.R.C.V.S., Halifax. Edin: April, 1871.

Death occurred on June 26th from cerebral hæmorrhage, at the age of 70.

WILLIAM WATSON, M.R.C.V.S., Dungannon, Co. Tyrone. Glas: May, 1899.

Mr. Watson died on June 12th. Aged 41 years.

CAMPBELL.—At a nursing home on the 26th ult., Ada Burgess, the dearly beloved wife of Duncan C. Campbell, M.R.C.V.S., Manchester, and Beechwood, Wilmslow, Cheshire.

REDWATER IN CATTLE.

Sir,

A note in last week's *Veterinary Record* on Redwater in Cattle prompted me to ask a favour from any of your readers on this subject. Has any member any experience, either at home or in the Colonies, of cattle that have had redwater in this country having another attack of the Texas fever after going over. I am given to understand by a fellow member in America that if cattle have had redwater in this country they will never get it again over there. Any information on the subject will be very welcome, and also any information as to the effect of trypanblue in the treatment of redwater in this country

NORTH WALIAN.